TC-WR97ES/WR870

SERVICE MANUAL

US Model
Canadian Model
E Model
TC-WR97ES
AEP Model
UK Model
TC-WR870

Photo: TC-WR870

Model Name Using Similar Mechanism	TC-WR820
Tape Transport Mechanism Type	TCM-200R4 /200R9

SPECIFICATIONS

Recording system 4-track 2-channel stereo
Fast winding time Approx. 90 sec. (with Sony C-60 cassette)
Bias AC bias
Signal-to-noise ratio (at peak level)

Dolby NR switch / Cassette	OFF	B-Type ON	C-Type ON
Type IV (Sony METAL-SLT)	59 dB	67 dB	74 dB
Type II (Sony UX-S)	58 dB	66 dB	73 dB
Type I (Sony HF-S)	56 dB	64 dB	71 dB

Total harmonic distortion 1.0% (with Sony METAL-SLT cassettes)

Frequency response (DOLBY NR OFF)

Type IV cassette (Sony METAL-SLT)	20 - 20,000 Hz (±3 dB, IEC) 30 - 15,000 Hz [±3 dB 0VU(-4 dB)recording]
Type II cassette (Sony UX-S)	25 - 17,000 Hz (±3 dB, IEC)
Type I cassette (Sony HF-S)	25 - 16,000 Hz (±3 dB, IEC)

Wow and flutter ±0.09% W.Peak (IEC)
0.06% WRMS (NAB)
±0.16% W.Peak (DIN)

Inputs

Line inputs (phono jacks)	Sensitivity	77.5 mV
	Input impedance	47 k ohms

Outputs

Line outputs (phono jacks)	Rated output level	0.32 V at a load impedance of 47 k ohms
	Load impedance	Over 10 k ohms
Headphones (stereo phone jack)	Output level	0–1.25 mW at a load impedance of 32 ohms

General

Power requirements
US, Canadian Model:
120 V AC, 60 Hz
AEP, Germany Model:
220 – 230 V AC, 50/60 Hz
UK Model: 240 V AC, 50 Hz
E Model: 120, 220, 240 V AC adjustable, 50/60 Hz
Power consumption 30 W
Dimensions Approx. 470 × 135 × 355 mm (w/h/d) (18⅝ × 5⅜ × 14 inches) including projecting parts and controls
Weight Approx. 7.5 kg (16 lbs 9 oz)

Supplied accessory Audio connecting cords (2)

Design and specifications subject to change without notice.

MICROFILM

STEREO CASSETTE DECK

SONY®

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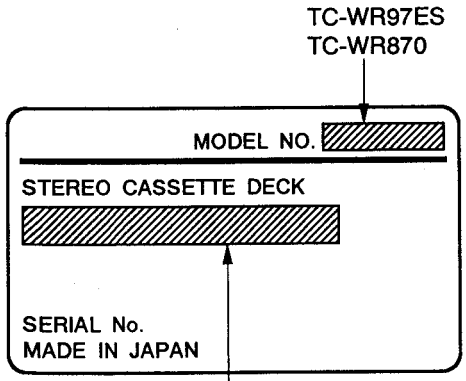
MODEL IDENTIFICATION

– Specification Label –



US, Canadian Model:	AC: 120V 60Hz 30W
Germany, AEP Models:	AC: 220 – 230V~50/60 Hz
UK Model:	AC: 240 V~50 Hz
E Model:	AC: 120, 220, 240 V~50/60 Hz 30W

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

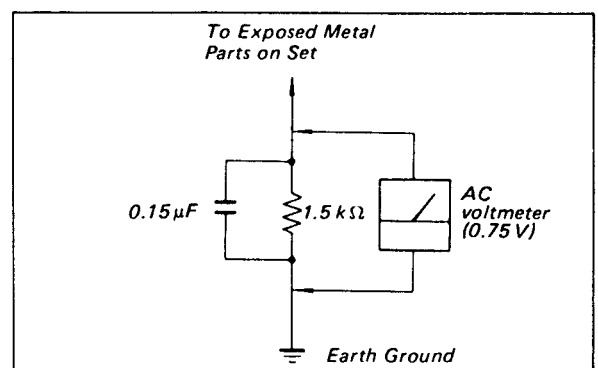


Fig. A. Using an AC voltmeter to check AC leakage.

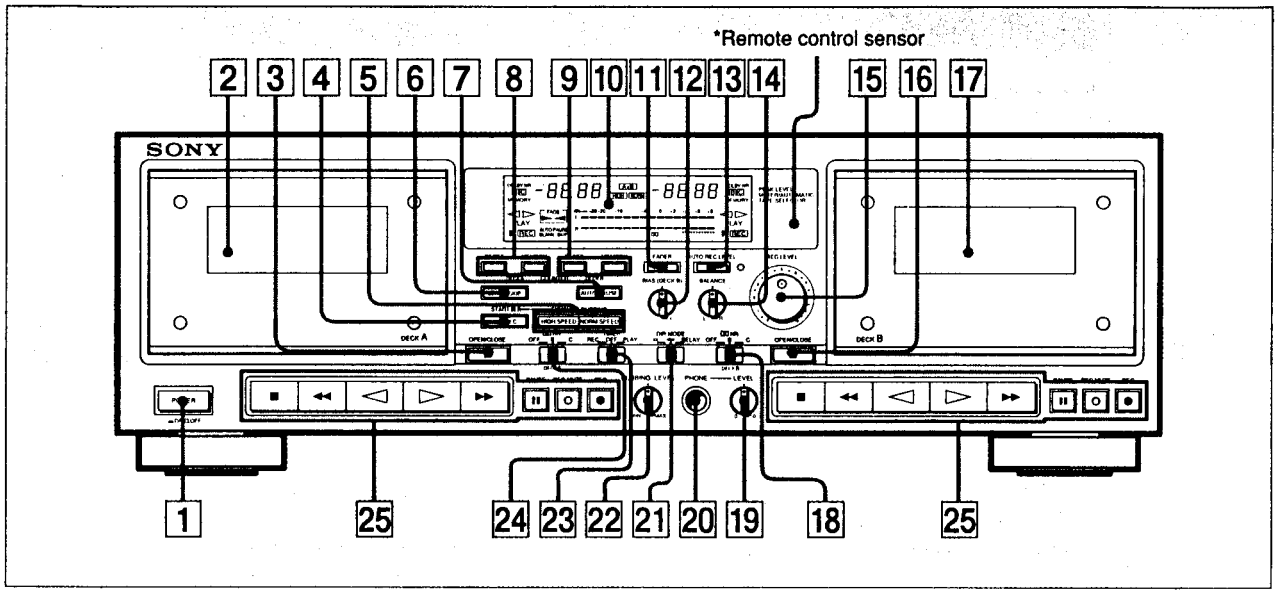
ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

This section is extracted from instruction manual.

SECTION 1
GENERAL

Identification of Front Panel Parts



For details, refer to the page number indicated in ●

1 **POWER switch**

2 **Deck A**

3 **⏏ OPEN/CLOSE button (deck A)**

4 **A+B REC (simultaneous recording) button** ⓯

5 **SYNCHRO DUBBING buttons** ⓲
HIGH SPEED button
NORM (normal) SPEED button

6 **BLANK SKIP button** ⓽

7 **AUTO PAUSE button** ⓳

8 **COUNTER buttons (deck A)** ⓫
RESET button
MEMORY button

9 **COUNTER buttons (deck B)** ⓫
RESET button
MEMORY button

10 **Display panel**

11 **FADER button** ⓱

12 **BIAS control (deck B)** ⓭

13 **AUTO REC (automatic recording) LEVEL button and indicator** ⓬ ⓭

14 **BALANCE control** ⓬

15 **REC (recording) LEVEL control** ⓬ ⓭

16 **⏏ OPEN/CLOSE button (deck B)**

17 **Deck B**

18 **DD NR (Dolby noise reduction) switch (deck B)** ❼ ❽ ⓬ ⓯ ⓰ ⓲

19 **Headphones LEVEL control** ❼

20 **PHONES (headphones) jack (stereo phone jack)** ❼

21 **DIR (direction) MODE switch** ❼ ❽ ⓬ ⓯ ⓰ ⓲

22 **DUBBING LEVEL control** ⓲

23 **TIMER switch** ❼ ⓴

24 **DD NR (Dolby noise reduction) switch (deck A)** ❼ ❽ ⓬ ⓯ ⓰ ⓲

25 **Tape operation buttons**
■ (stop) button
◀◀ (leftward fast winding) (AMS**) button
◀ (reverse play) button
▶ (forward play) button
▶▶ (rightward fast winding) (AMS**) button
II PAUSE button
O REC MUTE (record muting) button ⓰
● REC (recording) button

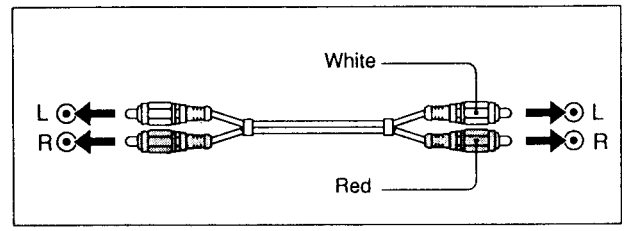
***Remote control sensor**
You can remotely control this cassette deck with:
—A remote commander that came with a Sony amplifier or receiver if it has the R mark and cassette deck control capability.
—Any optional Sony remote commander with the R mark and cassette deck control capability.

**AMS is an abbreviation for Automatic Music Sensor.

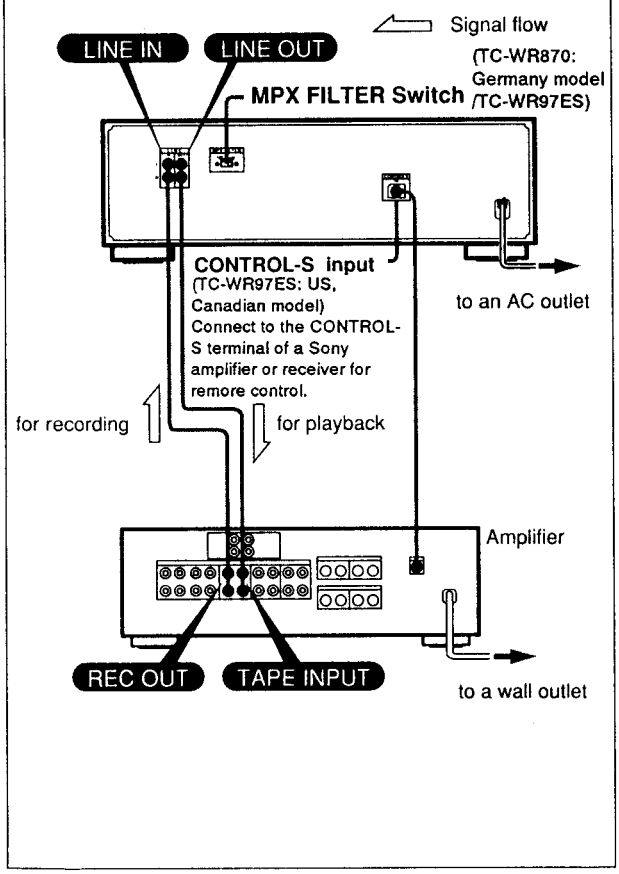
Connections

Notes on Connections

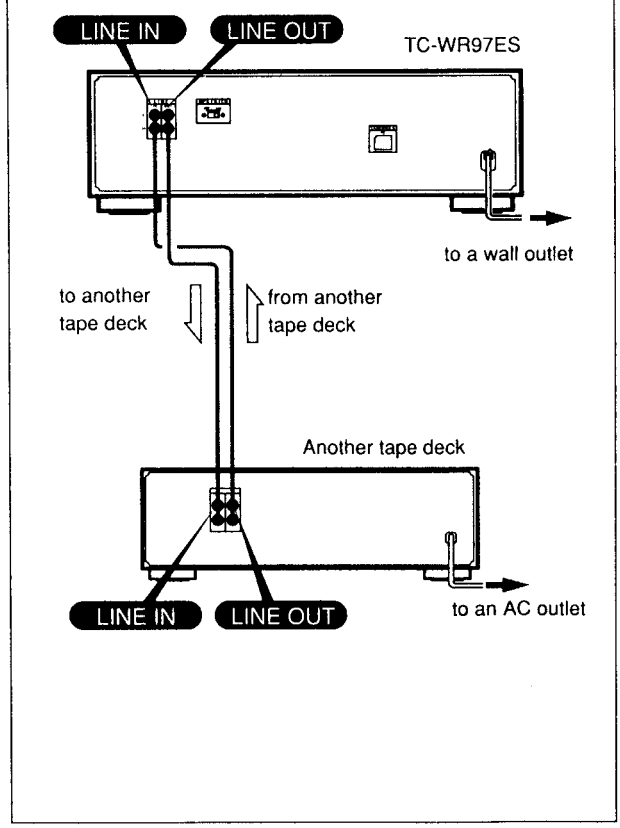
- Turn off the power to all equipment to be connected before making any connection.
- Note that the red plug of the supplied connecting cord is for right-channel (R) connection and the white plug for left-channel (L) connection.
- The connecting cords should be fully inserted into the jacks. A loose connection may cause hum pickup.



Basic Connection



Connection for Tape Dubbing



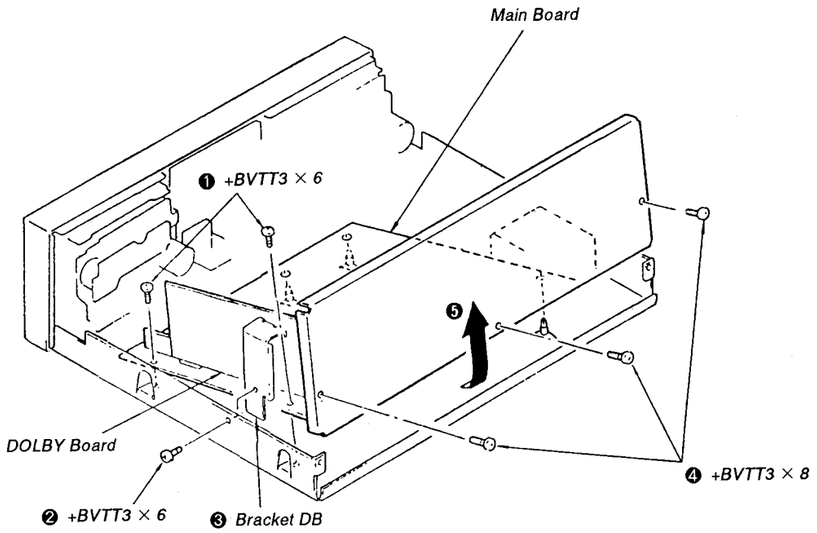
Note on the CONTROL-S input
To remote control this unit through a receiver or amplifier, connect the input on this unit to the CONTROL-S output on a Sony receiver or amplifier, with a CONTROL-S cable. When this connection is used, only remote commands sent through the receiver or amplifier will be executed. The remote sensor on this unit will not function.

SECTION 2
DISASSEMBLY

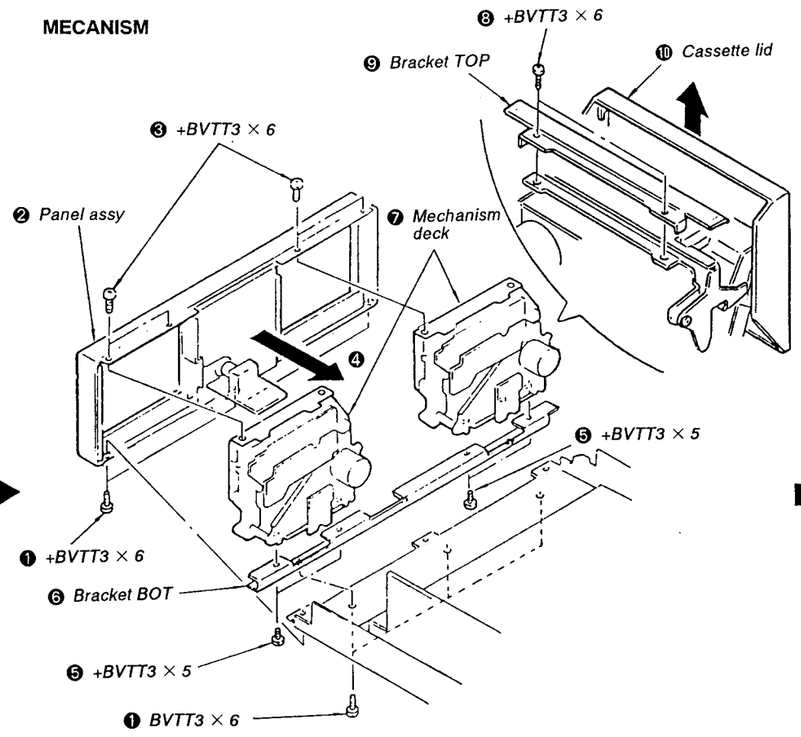
Note: Follow the disassembly procedure in the numerical order given.

Unscrew four screws (M3 × 8) and remove the upper case.

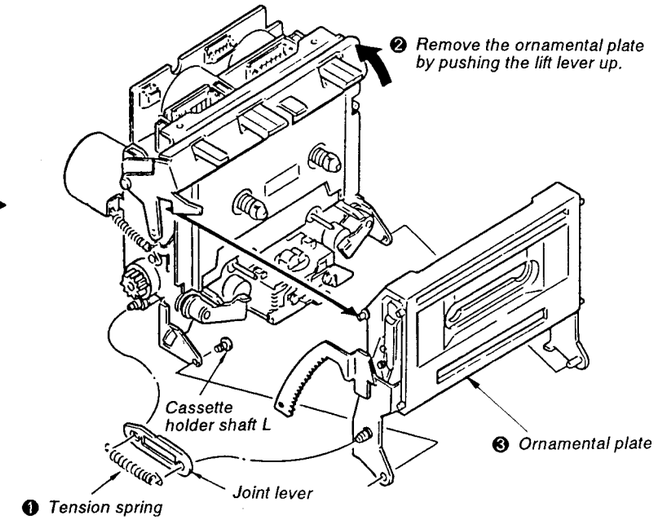
DOLBY BOARD, MAIN BOARD



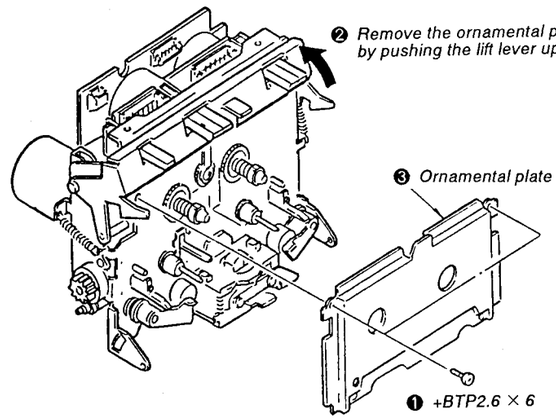
MECANISM



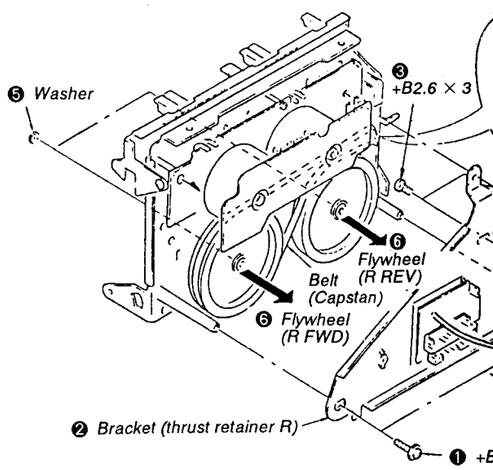
CASSETTE HOLDER


❷ Remove the ornamental plate by pushing the lift lever up.
Cassette holder shaft L
❸ Ornamental plate
❶ Tension spring
Joint lever

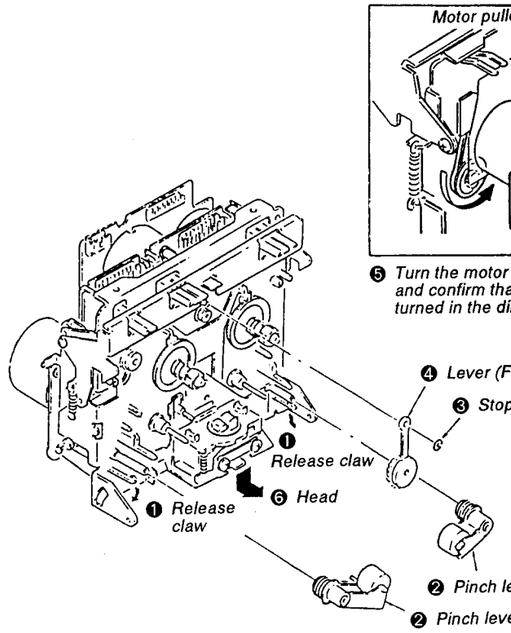
ORNAMENTAL PLATE



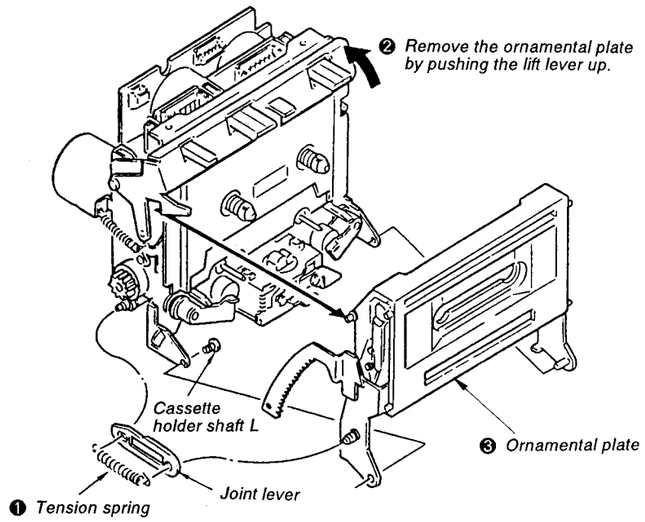
CAPSTAN PLATE, FLYWHEEL



PINCH LEVER, HEAD

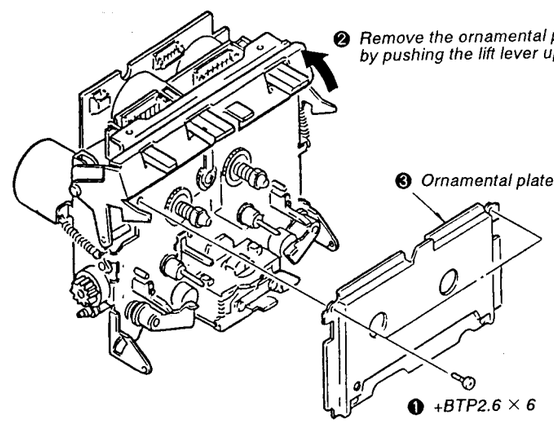


CASSETTE HOLDER

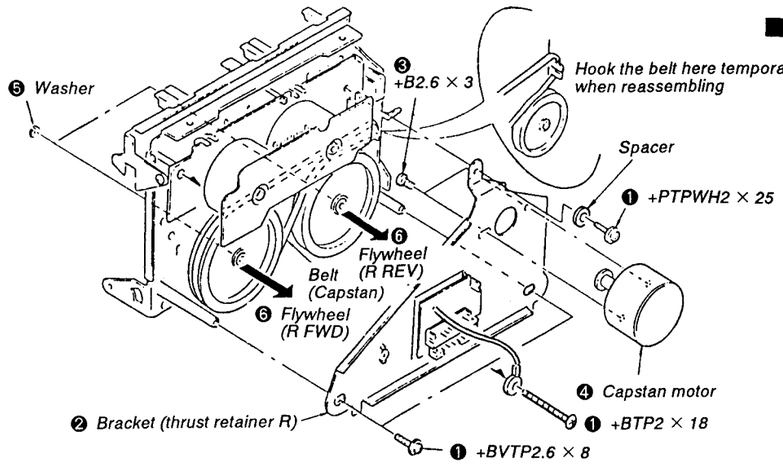

❷ Remove the ornamental plate by pushing the lift lever up.
Cassette holder shaft L
❸ Ornamental plate
❶ Tension spring
Joint lever

T3 × 8

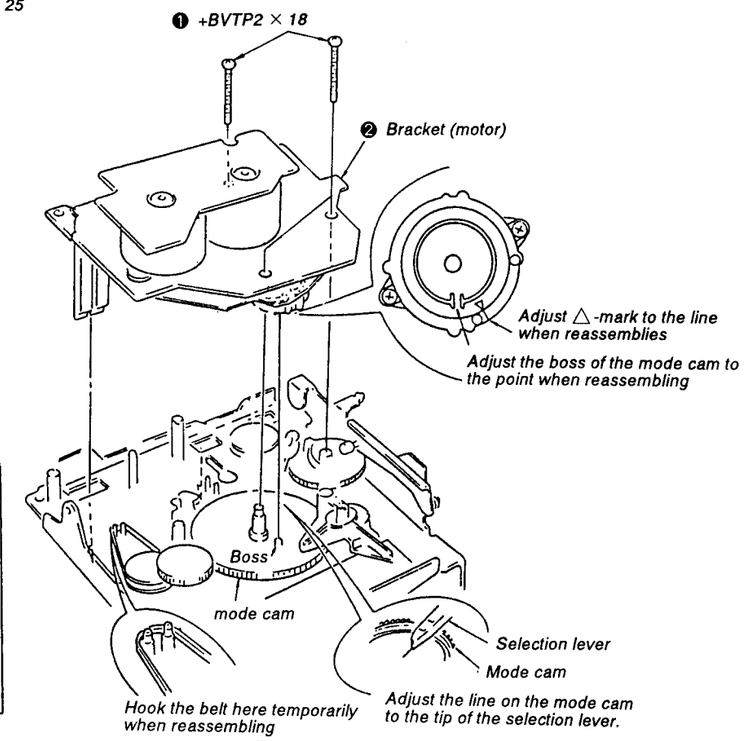
ORNAMENTAL PLATE



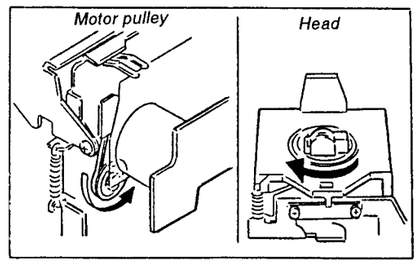
CAPSTAN PLATE, FLYWHEEL



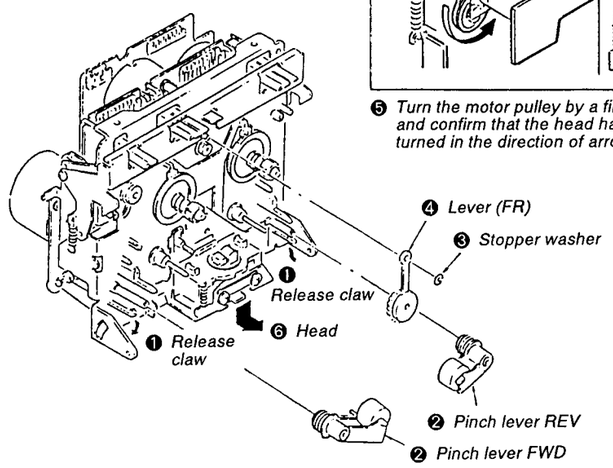
REEL AND ASSIST MOTORS

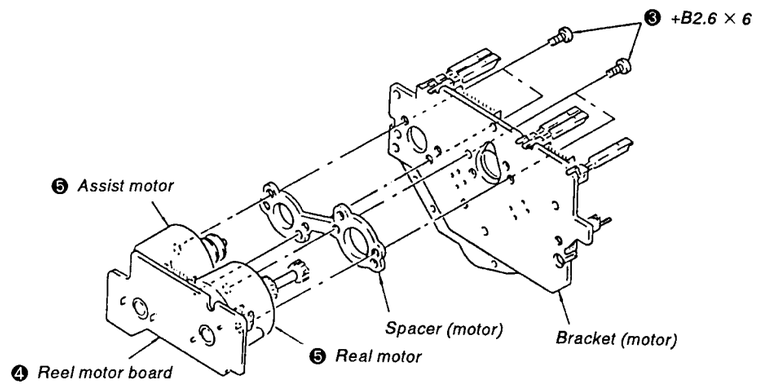

❶ +BVTP2 × 18
❷ Bracket (motor)
Adjust △-mark to the line when reassemblies
Adjust the boss of the mode cam to the point when reassembling
Boss
mode cam
Selection lever
Mode cam
Hook the belt here temporarily when reassembling
Adjust the line on the mode cam to the tip of the selection lever.

PINCH LEVER, HEAD



❺ Turn the motor pulley by a finger and confirm that the head has turned in the direction of arrow.





SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab :
   record/playback head　pinch roller
   erase head　rubber belts
   capstan　idler
2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed in the rated power supply voltage unless otherwise noted.

Torque Measurement

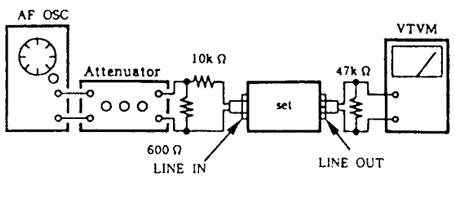
Torque	Torque meter	Meter reading
FWD	CQ-102C	30 – 60g•cm (0.42 – 0.83oz•inch)
FWD Back tention	CQ-102C	1 – 5g•cm (0.014 – 0.063oz•inch)
REV	CQ-102RC	30 – 60g•cm (0.42 – 0.83oz•inch)
REV Back tention	CQ-102RC	1 – 5g•cm (0.014 – 0.063oz•inch)
FF, REW	CQ-201B	65 – 90 g•cm (0.90 – 1.25 oz•inch)

3-2. ELECTRICAL ADJUSTMENT

Note : The adjustment should be performed in the order given in the service manual. As a rule, adjustments about playback should be performed before those about recording. The adjustments should be performed for both L-CH and R-CH.

- Switches and controls should be set as follows unless otherwise specified.
  DOLBY NR switch : OFF
  DIRECTION switch : ⇄
  TIMER switch : OFF
  MPX FILTER switch (TC-WR97ES) : OFF
- Standard Record :
  Deliver the standard input signal level to the input jack and set the REC LEVEL control to obtain the standard output signal level.

–Record Mode–



0 dB = 775mV

Standard Input Level

input terminal	LINE IN
source impedance	10k Ω
input level	0.25V (–10dB)

Standard Output Level

output terminal	LINE OUT
load impedance	47k Ω
output level	0.32 V (– 7.7 dB)

Test tape

Type	Signal	Used for
P-4-A100	10kHz, –10dB	Azimuth Adjustment
P-4-L300	315Hz, 0dB	PB Level Adjustment
WS-48B	3kHz, 0dB	Tape Speed Adjustment

The set will get into TEST MODE by shorting the pins of TP801 (TEST) on Main board before turning the power on, and TEST MODE functions as follows :

1. High speed playback
   Pressing HIGH SPEED (DUBBING) button while playback changes to high speed playback and another press of the button returns the set to normal speed playback.
2. Record memory stop
   When starting recording, tape counter is reset to zero and counter memory turned on.

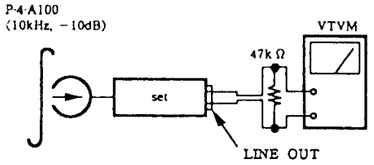
Record/Playback Head Azimuth Adjustment

DECK A DECK B

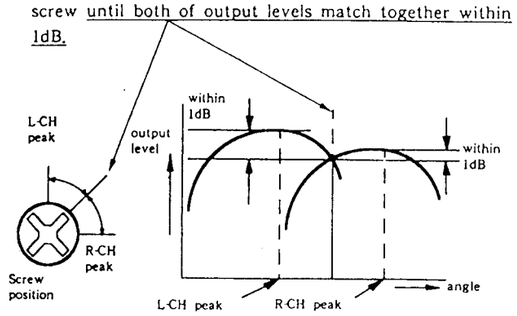
Procedure :

1. Mode : FWD playback

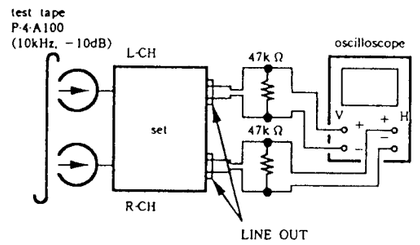
Test tape
P-4-A100
(10kHz, –10dB)



2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1dB.



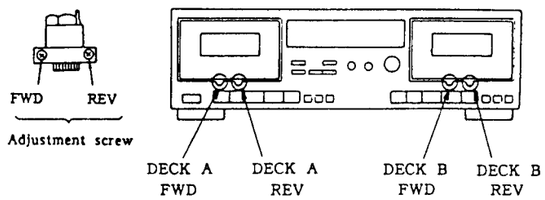
3. Phase Check
   Mode : playback



Screen pattern				
in phase	45°	90°	135°	180°
good			wrong	

4. Set in the REV mode and repeat the step 1-3.
5. After the adjustment, lock the screws with locking compound.

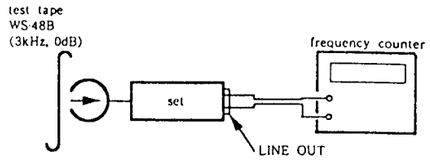
Adjustment Location : Record/Playback head



Tape Speed Adjustment DECK A DECK B

Procedure :
Mode : playback

Perform high speed adjustment before mormal speed adjustment



(high speed adjustment)
1. Short test pin TP801 (TEST) on Main board.
2. Set to FWD playback mode.
3. Press the HIGH SPEED DUBBING switch.
4. Adjust RV871 (DECK A) and RV881 (DECK B) on Main board so that the frequency counter reading becomes 6,000 ± 30Hz.
5. After adjustment, disconnect TP801 shorted in step 1.

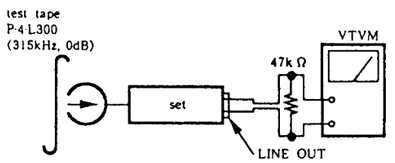
(normal speed adjustment)
1. Set to FWD playback mode.
2. Adjust RV872 (DECK A) and RV882 (DECK B) on Main board so that the frequency counter reading becomes 3,000 ± 15Hz.

Frequency difference between the begining and the end of the tape should be within 5%.
Frequency difference between deck A and deck B should be within 20 Hz (high speed) or 10 Hz (normal speed).

Adjustment Location: Main board

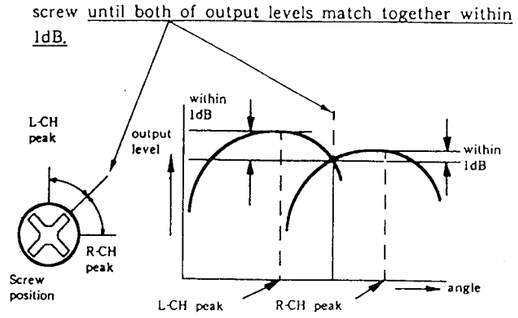
Playback Level Adjustment DECK A DECK B

Procedure :
Mode : playback

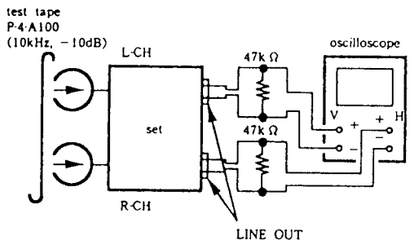


Adjust RV131 (L-ch) and RV231 (R-ch) for DECK A and RV151 (L-ch) and RV251 (R-ch) for DECK B so that the reading on VTVM meets the adjustment limits below.

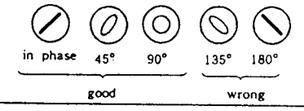
2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1dB.



3. Phase Check
Mode : playback

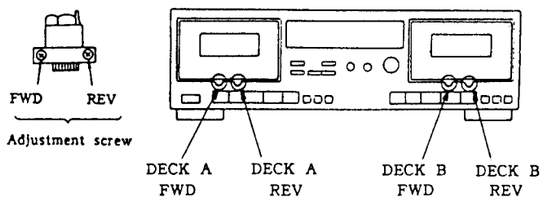


Screen pattern



4. Set in the REV mode and repeat the step 1-3.
5. After the adjustment, lock the screws with locking compound.

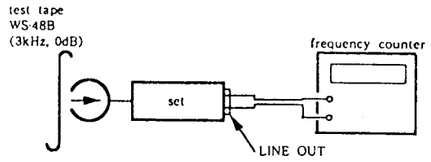
Adjustment Location : Record/Playback head



Tape Speed Adjustment DECK A DECK B

Procedure :
Mode : playback

Perform high speed adjustment before mormal speed adjustment



(high speed adjustment)
1. Short test pin TP801 (TEST) on Main board.
2. Set to FWD playback mode.
3. Press the HIGH SPEED DUBBING switch.
4. Adjust RV871 (DECK A) and RV881 (DECK B) on Main board so that the frequency counter reading becomes 6,000 ± 30Hz.
5. After adjustment, disconnect TP801 shorted in step 1.

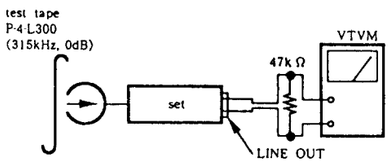
(normal speed adjustment)
1. Set to FWD playback mode.
2. Adjust RV872 (DECK A) and RV882 (DECK B) on Main board so that the frequency counter reading becomes 3,000 ± 15Hz.

Frequency difference between the begining and the end of the tape should be within 5%.
Frequency difference between deck A and deck B should be within 20 Hz (high speed) or 10 Hz (normal speed).

Adjustment Location: Main board

Playback Level Adjustment DECK A DECK B

Procedure :
Mode : playback



Adjust RV131 (L-ch) and RV231 (R-ch) for DECK A and RV151 (L-ch) and RV251 (R-ch) for DECK B so that the reading on VTVM meets the adjustment limits below.

Adjustment Limits :
LINE OUT level: − 7.7 ± 0.5dB (0.30 − 0.34 V)
Level difference between channels : less than 0.5dB
Check that the LINE OUT level does not change even if Playback and Stop operation is repeated several times.

Adjustment Location : MAIN board

Bias Current Adjustment

Procedure :
1. Set RV121 and RV221 (DECK A), RV141 and RV241 (DECK B) to mechanical center and turn the set recording mode.
2. Connect digital voltmeter as shown by the following table.
3. Adjust the following transformers for the minimum readings on the digital voltmeter.

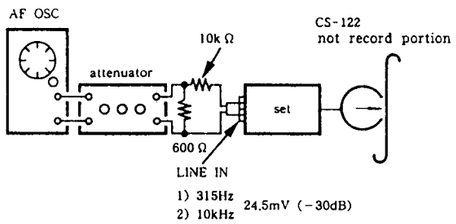
DECK		Mesurement Point	Adjustment	Value
A	L	① and ②, TP521	T121	less than 80 mV
	R	② and ③, TP521	T221	
B	L	① and ②, TP541	T141	
	R	② and ③, TP541	T241	

Adjustment Location : MAIN board

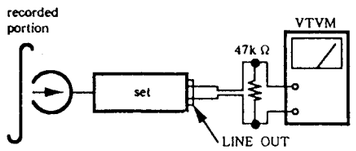
Record Bias Adjustment DECK A DECK B

Setting :
REC LEVEL control : standard Record (See page 8.)
test pin TP801 : short

Procedure :
1. Mode : record



2. Mode : playback



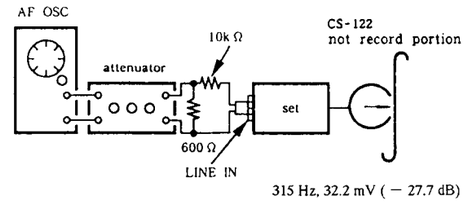
Playback the signal recorded in step 1.
Confirm that the 10kHz playback output is 0 ± 0.5dB relative to the 315Hz output. If necessary, adjust RV121 (L-ch) and RV221 (R-ch) for DECK A and RV141 (L-ch) and RV241 (R-ch) for DECK B, and repeat the steps given above.

Adjustment Location : MAIN board

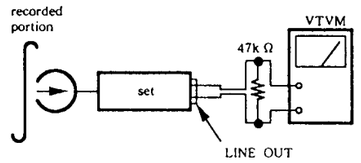
Record Level Adjustment DECK A DECK B

Setting :
REC LEVEL control : Standard Record (See page 8.)
test pin TP801 : short

Procedure :
1. Mode : record



2. Mode : playback



3. Playback the signal recorded in step1.
Confirm that the signal level is within the adjustment limits below. If necessary, adjust RV301 (L-ch) and RV401 (R-ch) for DECK A and RV351 (L-ch) and RV451 (R-ch) for DECK B, and repeat the step1-2.

Adjustment Limits: − 27.7 dB ± 0.5 dB (30.4 − 34.2 mV)

Adjustment Location: Main board (component side)

Quick Reverse Sensitivity Adjustment DECK A DECK B

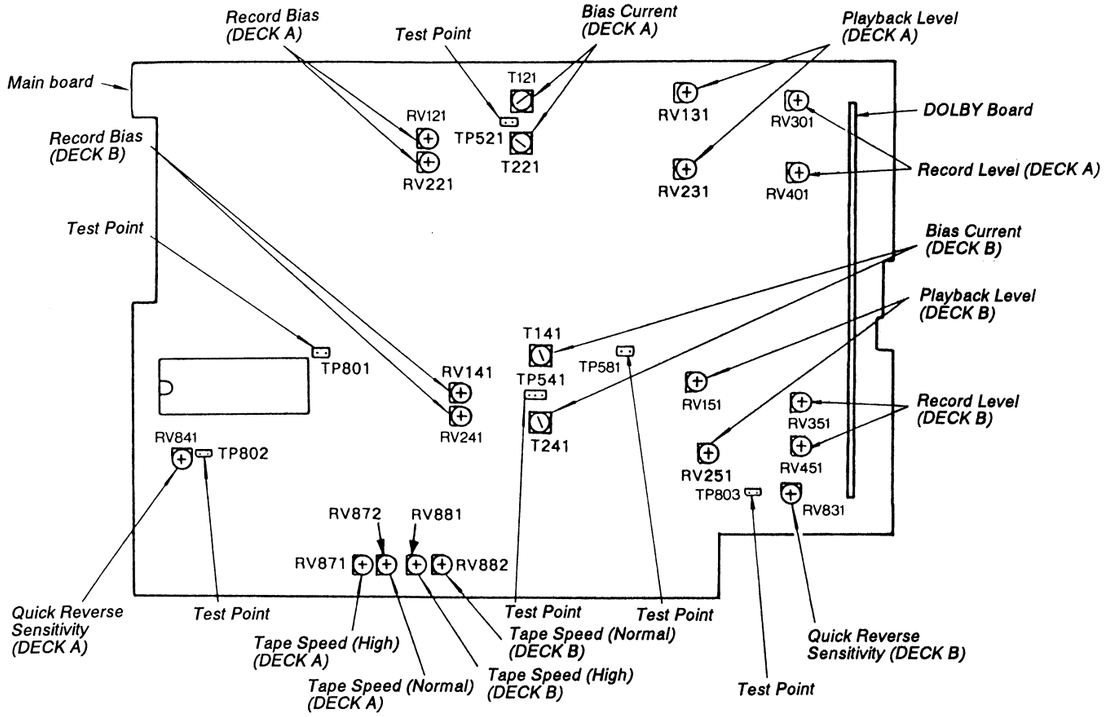
Conditions :
DIRECTION MODE switch : ⇄

Adjustment procedure :

1. Connect the digital voltmeter to test point TP802 (DECK A) /TP803 (DECK B).
2. Load C-120 tape cassette and playback the leading portion in FWD mode.
3. Adjust the RV841 (DECK A), RV831 (DECK B) for 4.5 ± 0.5V reading on the digital voltmeter.
4. Playback C-120 tape cassette in FWD mode again.
5. Confirm that the reading on the digital voltmeter is "L" level at the magnetic portion of the tape.
6. Confirm that the tape stop around the tape end (boder of the leading and the magnetic portions).

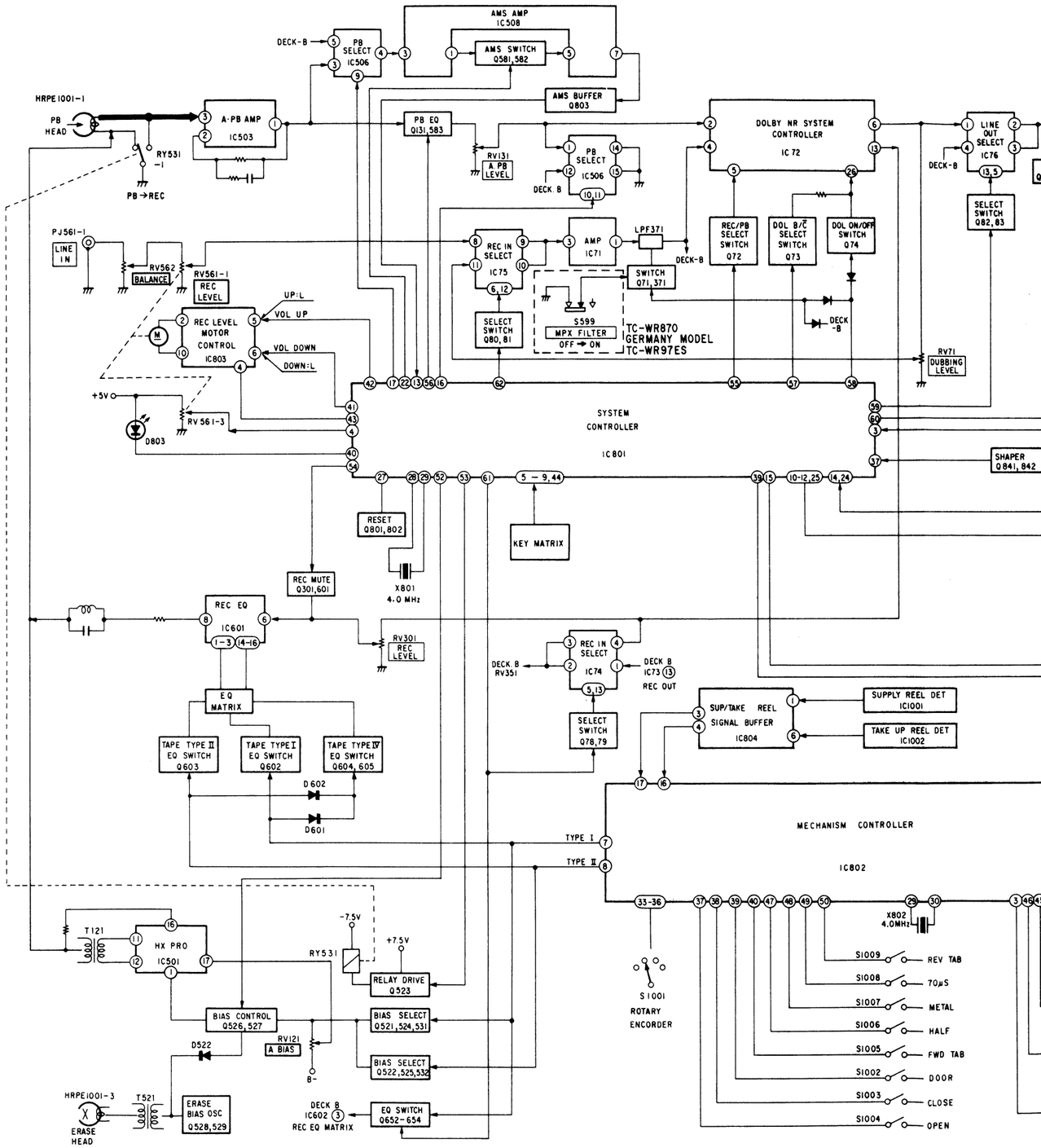
Adjustment Location : MAIN board

Adjustment Parts Location Diagram



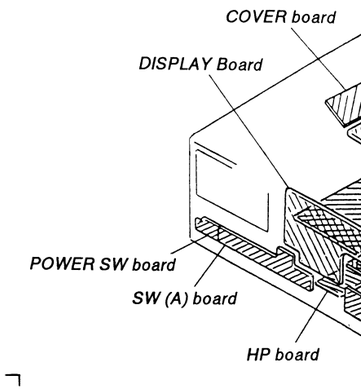
SECTION 4
DIAGRAMS

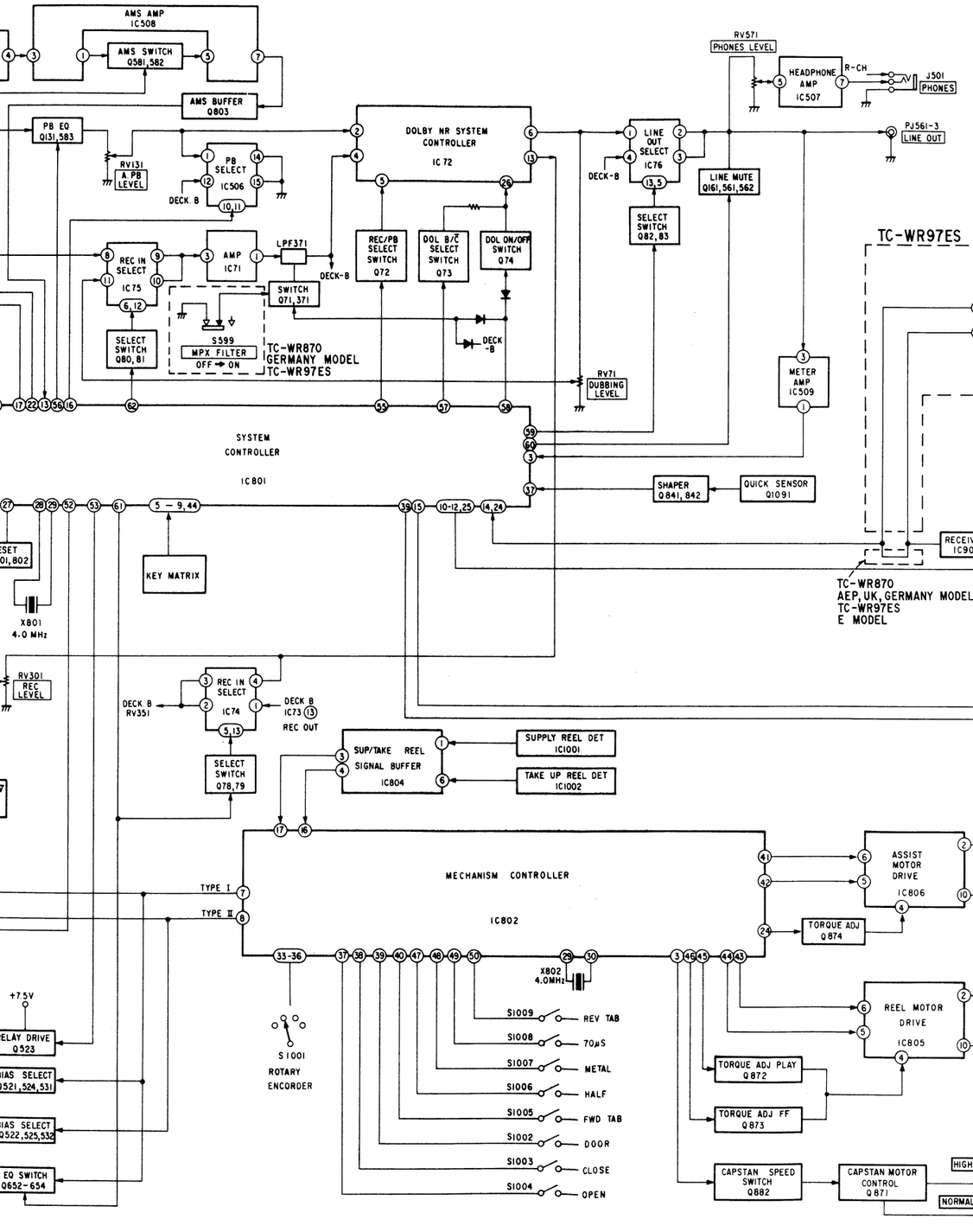
4-1. BLOCK DIAGRAM

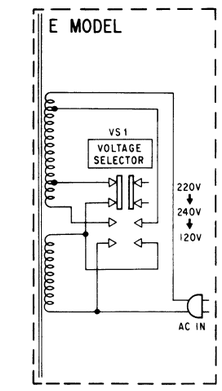


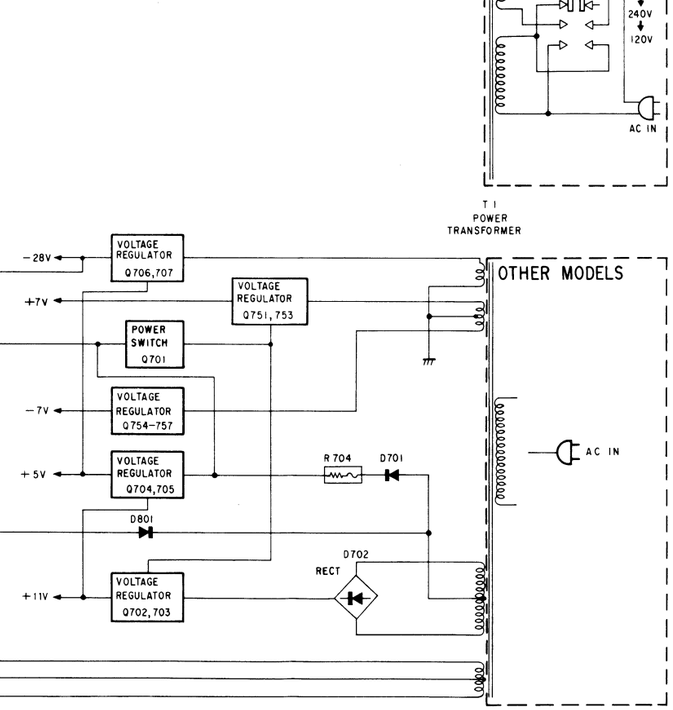
16

• Circuit Boards Location









RV571
ES LEVEL

HEADPHONE AMP IC507

R-CH

J501 PHONES

PJ561-3 LINE OUT

MUTE
,562

TC-WR97ES US, CANADIAN MODEL

NAND GATE IC809

CNJ 1 CONTROL S

METER AMP IC509

QUICK SENSOR Q1091

RECEIVER IC902

TC-WR870
AEP, UK, GERMANY MODEL
TC-WR97ES
E MODEL

SAF D901

+5V

FL DRIVE Q901-903

FL DRIVE IC901

FLUORESCENT LIGHT INDICATOR FL901

X901
4.19 MHz

S901-2

S901-1

POWER ON→OFF

ASSIST MOTOR DRIVE IC806

M1052 ASSIST MOTOR

TORQUE ADJ Q874

REEL MOTOR DRIVE IC805

M1051 REEL MOTOR

QUE ADJ PLAY Q872

QUE ADJ FF Q873

STAN SPEED SWITCH Q882

CAPSTAN MOTOR CONTROL Q871

HIGH RV871

NORMAL RV872

+11V

M1053-A CAPSTAN MOTOR

E MODEL

VS1 VOLTAGE SELECTOR

220V
240V
120V

AC IN

T1 POWER TRANSFORMER

OTHER MODELS

VOLTAGE REGULATOR Q706,707

−28V

+7V

VOLTAGE REGULATOR Q751,753

POWER SWITCH Q701

−7V

VOLTAGE REGULATOR Q754-757

+5V

VOLTAGE REGULATOR Q704,705

R704

D701

D801

D702

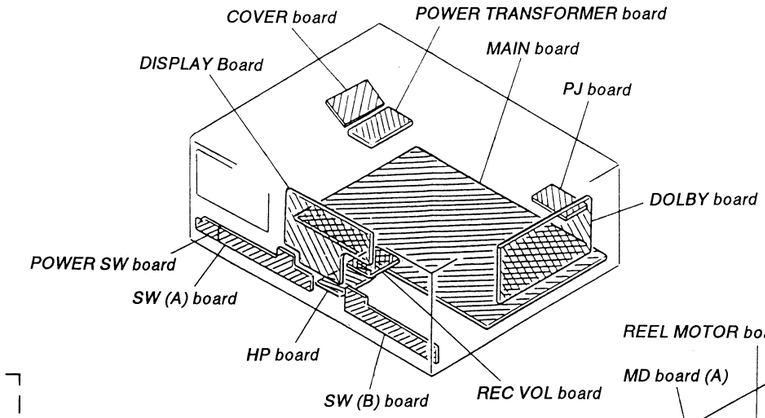
RECT

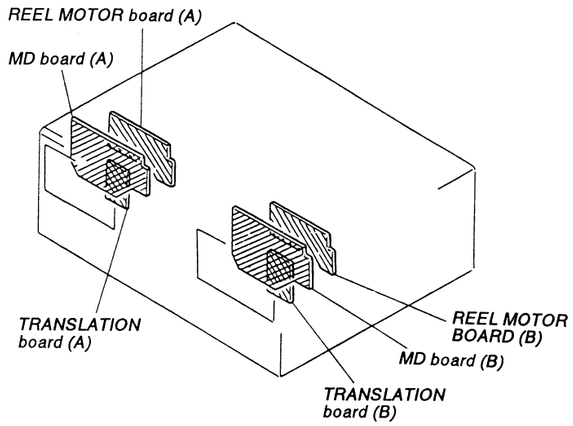
+11V

VOLTAGE REGULATOR Q702,703

AC IN

• Circuit Boards Location





4-2. PRINTED WIRING BOARDS

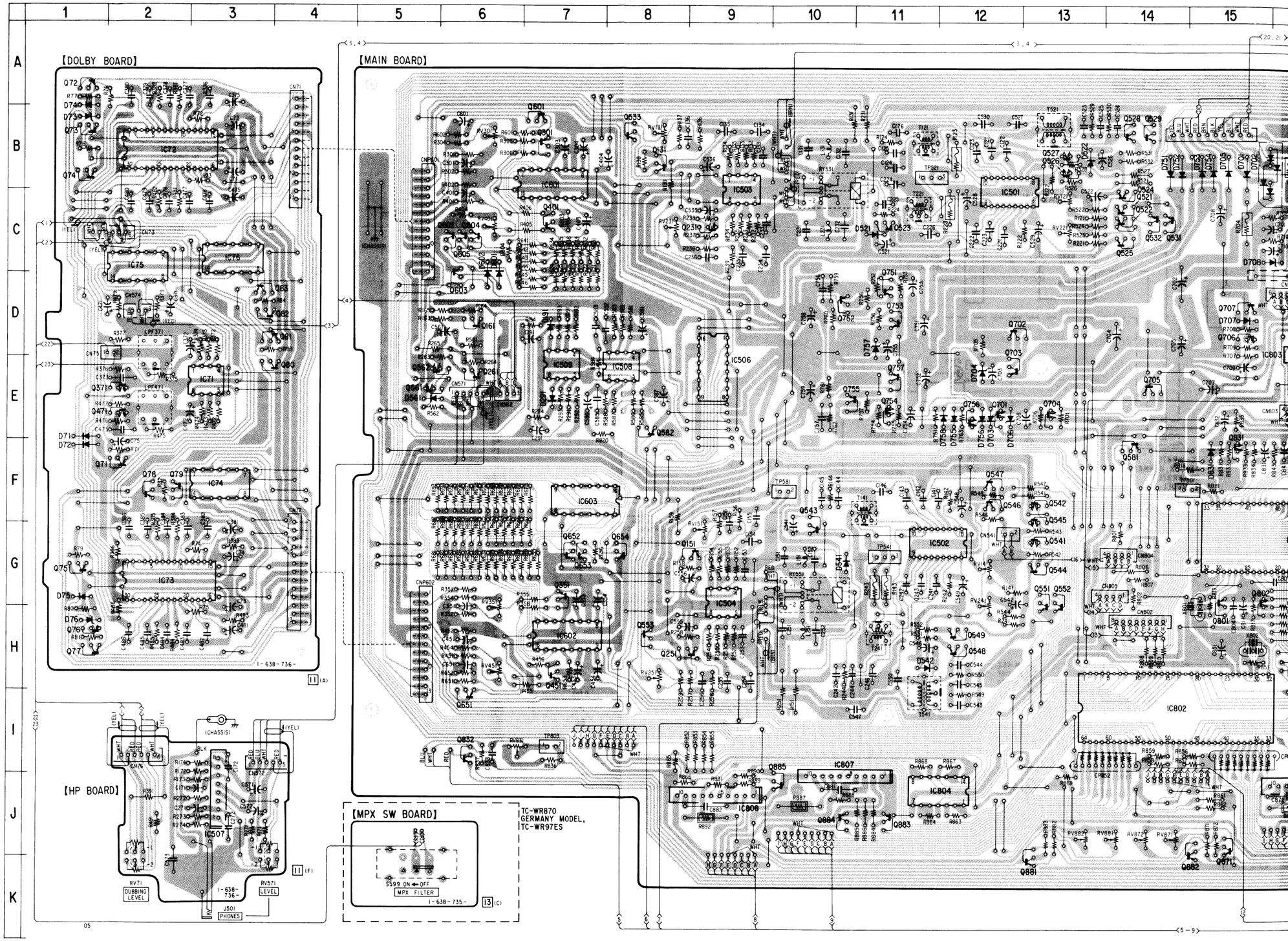
• See Page 15 for Circuit Boards Location, Page 21 for Semiconductor Lead Layouts.

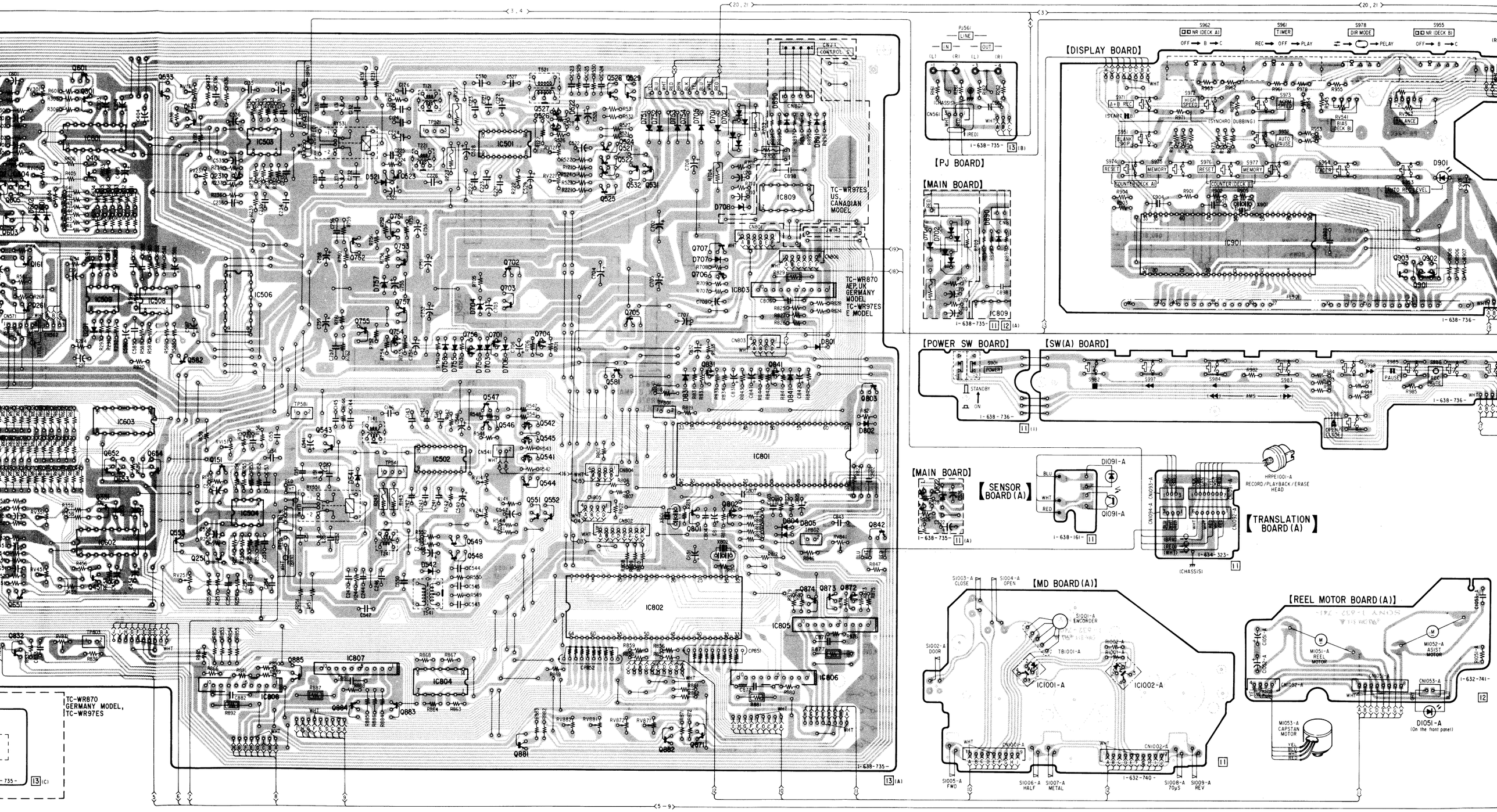
• Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D71	E-1	IC601	B-7	Q544	G-13
D72	F-1	IC602	H-7	Q545	F-13
D73	B-1	IC603	F-7	Q546	F-12
D74	B-1	IC801	G-16	Q547	F-12
D75	G-1	IC802	I-14	Q548	H-12
D76	H-1	IC803	D-16	Q549	H-12
D191	D-7	IC804	J-12	Q551	G-13
D291	E-7	IC805	I-17	Q552	G-13
D521	C-11	IC806	J-16	Q553	H-8
D522	B-13	IC807	J-10	Q561	E-5
D541	G-10	IC808	J-9	Q562	E-5
D542	H-11	IC809	C-16	Q581	F-14
D561	E-5	IC901	D-22	Q582	E-8
D601	D-6	IC902	D-26	Q601	B-7
D602	D-6	IC1001-A	J-19	Q602	C-6
D701	B-15	IC1001-B	J-27	Q603	D-6
D702	B-15	IC1002-A	J-21	Q604	C-6
D703	E-12	IC1002-B	J-28	Q605	C-6
D704	E-12			Q651	I-6
D705	B-15	Q71	F-2	Q652	G-7
D706	E-12	Q72	A-1	Q653	G-7
D707	D-15	Q73	B-1	Q654	G-7
D708	C-15	Q74	B-1	Q701	E-12
D751	B-14	Q75	G-1	Q702	D-12
D752	B-14	Q76	H-1	Q703	E-12
D753	B-15	Q77	H-1	Q704	E-13
D754	B-15	Q78	F-2	Q705	E-14
D755	E-12	Q79	F-2	Q706	D-15
D756	E-12	Q80	E-3	Q707	D-15
D757	D-11	Q81	D-3	Q751	D-11
D758	E-12	Q82	D-3	Q752	D-10
D801	E-16	Q83	D-3	Q753	D-11
D802	F-17	Q131	B-8	Q754	E-11
D804	H-16	Q151	G-9	Q755	E-10
D805	H-16	Q161	D-6	Q756	E-12
D831	F-15	Q231	C-9	Q757	E-11
D841	F-16	Q251	H-8	Q801	G-15
D890	B-16	Q261	E-6	Q802	G-15
D891	B-17	Q301	B-7	Q803	F-17
D901	C-25	Q351	G-7	Q831	F-15
D1051-A	J-25	Q371	E-2	Q832	I-6
D1051-B	J-32	Q401	C-7	Q841	F-16
D1091-A	G-20	Q451	H-7	Q842	H-17
D1091-B	G-28	Q471	E-2	Q871	J-15
		Q521	C-14	Q872	I-17
IC71	E-3	Q522	C-14	Q873	I-17
IC72	B-2	Q523	C-11	Q874	I-16
IC73	G-2	Q524	C-14	Q881	J-13
IC74	F-3	Q525	C-14	Q882	J-15
IC75	C-2	Q526	B-13	Q883	J-11
IC76	C-3	Q527	B-13	Q884	J-10
IC501	C-12	Q528	B-14	Q885	J-10
IC502	G-11	Q529	B-14	Q901	D-25
IC503	B-9	Q531	C-14	Q902	D-25
IC504	G-9	Q532	C-14	Q903	D-24
IC506	E-9	Q533	B-8	Q1091-A	G-20
IC507	J-3	Q541	G-13	Q1091-B	G-28
IC508	E-8	Q542	F-13		
IC509	E-7	Q543	G-10		

Note:

- ○——— : parts extracted from the component side.
- [ ]— : indicates side identified with part number.




【PJ BOARD】
【MAIN BOARD】
【DISPLAY BOARD】
【POWER SW BOARD】
【SW(A) BOARD】
【MAIN BOARD】
【SENSOR BOARD (A)】
【TRANSLATION BOARD (A)】
【MD BOARD (A)】
【REEL MOTOR BOARD (A)】
TC-WR97ES US CANADIAN MODEL
TC-WR870 AEP,UK GERMANY MODEL TC-WR97ES E MODEL
TC-WR870 GERMANY MODEL, TC-WR97ES
IC501
IC502
IC503
IC504
IC506
IC601
IC602
IC603
IC801
IC802
IC803
IC804
IC805
IC807
IC809
IC901
IC1001-A
IC1002-A
DI091-A
HRPE1001-A RECORD/PLAYBACK/ERASE HEAD
DI051-A (On the front panel)
MI051-A REEL MOTOR
MI052-A ASIST MOTOR
MI053-A CAPSTAN MOTOR

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

(20, 21)

TC-WR97ES US CANADIAN MODEL

TC-WR870 AEP, UK GERMANY MODEL
TC-WR97ES E MODEL

CN1 CONTROL

IC809

CN807

CN806

D801

D802

D803

D804

D805

Q842

IC805

IC806

I-638-735- 13 (A)

PJ561 LINE IN OUT (L) (R) (L) (R)

CN561 (CHASSIS)

I-638-735- 13 (B)

【PJ BOARD】

【MAIN BOARD】

IC809

I-638-735- 11 12 (A)

【DISPLAY BOARD】

S962 NR (DECK A) OFF → B → C

S961 TIMER REC → OFF → PLAY

S978 DIR MODE → PELAY

S955 NR (DECK B) OFF → B → C

S971 A+B REC (START)

S972 HIGH SPEED (SYNCHRO DUBBING)

S973 MANU SPEED

S991 BLANK SKIP

S998 AUTO PAUSE

S974 RESET

S975 MEMORY

S976 RESET

S977 MEMORY

COUNTER (DECK A)

COUNTER (DECK B)

S954 PAUSE

S963 INTO REC LEVEL

RV541 BIAS DECK B

RV542 BALANCE

D901

IC902

Q901 Q902 Q903

I-638-736- 11 (B)

【REC VOL BOARD】

D803 (REC LEVEL)

RV561 REC LEVEL

I-638-736- 11 (E)

【POWER SW BOARD】

S901 POWER

STANDBY

ON

I-638-736- 11 (I)

【SW(A) BOARD】

S982 S997 S984 S983 S982 S998 S985 S986 S999

AMS

PAUSE

REC MUTE

REC

OPEN/CLOSE

I-638-736- 11 (D)

【SW(B) BOARD】

S992 S987 S991 S993 S994 S996 S995 S988 S989 S999

I-638-736- 11 (C)

【POWER TRANSFORMER BOARD】

US, CANADIAN MODEL

【COVER BOARD】

TC-WR97ES US, CANDIAN MODEL

TI POWER

AC IN

I-638-736- 11 (H)

I-638-736- 11 (G)

E MODEL

RED ORG WHT GRY BLU

ORG

VS1 VOLTAGE SELECTOR 220V 240V 120V

WHT RED GRY ORG BLU

AC IN

AEP, UK, GERMANY MODEL

AC IN BLU

UK MODEL BRN

BRN

AEP, GERMANY MODEL

【SENSOR BOARD (A)】

DI091-A

Q1091-A

BLU WHT RED

I-638-161- 11

【TRANSLATION BOARD (A)】

CN094-A CN093-A CN092-A

I-634-323-

(CHASSIS) 11

HRPE1001-A RECORD/PLAYBACK/ERASE HEAD

【SENSOR BOARD (B)】

DI091-B

Q1091-B

BLU WHT RED

I-638-161- 11

【TRANSLATION BOARD (B)】

CN094-B CN093-B CN092-B

I-634-323-

(CHASSIS) 11

HRPE1001-B RECORD/PLAYBACK/ERASE HEAD

【MD BOARD (A)】

SI003-A CLOSE

SI004-A OPEN

SI002-A DOOR

SI001-A ENCORDER

TBI001-A

RI002-A RI001-A

ICI001-A

ICI002-A

CN002-A CN001-A CN1002-A

SI005-A FWD

SI006-A HALF

SI007-A METAL

SI008-A 70μS

SI009-A REV

I-632-740- 11

【REEL MOTOR BOARD (A)】

MI051-A REEL MOTOR

MI052-A ASIST MOTOR

CN052-A CN051-A CN053-A

I-632-741- 12

MI053-A CAPSTAN MOTOR

YEL BLU WHT BRN RED

DI051-A (On the front panel)

【MD BOARD (B)】

SI003-B CLOSE

SI004-B OPEN

SI002-B DOOR

SI001-B ENCORDER

TBI001-B

RI002-B RI001-B

ICI001-B

ICI002-B

CN002-B CN001-B CN1002-B

SI005-B FWD

SI006-B HALF

SI007-B METAL

SI008-B 70μS

SI009-B REV

I-632-740- 11

【REEL MOTOR BOARD (B)】

MI051-B REEL MOTOR

MI052-B ASIST MOTOR

CN052-B CN051-B CN053-B

I-632-741- 12

MI053-B CAPSTAN MOTOR

YEL BLU WHT BRN RED

DI051-B (On the front panel)

【MAIN BOARD(1/2)】

IC501 A Hx PRO — IC501 μPC1297CA
IC601 A REC EQ — IC601 CXA1198AP
IC602 B REC EQ — IC602 CXA1198AP
IC503 A PB AMP — IC503 (1/2) μPC4570C-1, IC503 (2/2) μPC4570C-1
IC504 B PB AMP — IC504 (1/2) μPC4570C-1, IC504 (2/2) μPC4570C-1
IC502 B Hx PRO — IC502 μPC1297CA
IC506 PB SELECT — MC14053BCP
IC508 AMS AMP — IC508 (1/2) RC4558P, IC508 (2/2) RC4558P

Q523 2SA1348 A RELAY DRIVE
Q526,527 A BIAS CONTROL
Q521 2SA1345
Q522 2SA1345
Q524 2SC3399
Q525 2SC3399
Q526 2SC3402
Q527 2SA1317
Q528 2SC2001
Q529 2SC2001
Q531 2SC3399
Q532 2SC3399
Q533 2SA1345
Q601 2SA1345
Q602 2SC3399
Q603 2SC3399
Q604 2SC2603
Q301,401,601 A REC MUTE
Q602–605 A EQ SWITCH
Q521,522,524,525,531,532 A BIAS SELECT
Q528,529 A BIAS OSC
Q131,231,533 A PB EQ
Q151,251,553 B PB EQ
Q543 B RELAY DRIVE
Q546,547 B BIAS CONTROL
Q541,542,544,545,551,552 B BIAS SELECT
Q548,549 B BIAS OSC
Q581,582 AMS SWITCH

T121 1-433-382-11
T221 1-433-382-11
T521 1-433-336-11
T141 1-433-382-11
T241 1-433-382-11
T541 1-433-336-11

RY531
RY551
SCN531
SCN551
HRPE1001-A EPA712-3602A
HRPE1001-B RPA712-3602A
CN541 6R2P

A BIAS
A RELAY
TO MAIN BOARD(2/2)
A TYPE I
A TYPE II
REC MUTE A
LINE MUTE
REC MUTE B
PB EQ B
A PB 70U
B BIAS
B RELAY
AMS SELECT A/B
PB MUTE A/B
AMS 85
AMS SIG
A REC MUTE
B REC MUTE
A PB LEVEL (L)
A PB LEVEL (R)
B PB LEVEL (L)
B PB LEVEL (R)
A PB.GAIN
B PB.GAIN
BIAS FINE
DHIGH 70U

【TRANSLATION BOARD(A)(1/2)】
【TRANSLATION BOARD(B)(1/2)】
【DISPLAY BOARD(2/3)】

R1	R2	NPN	PNP
10K	10K	BA1A4M (2SC3402)	BN1A4M (2SA1348)
47K	47K	BA1L4M (2SC3399)	BN1L4M (2SA1345)
4.7K	—	BA1L3Z (2SC3901)	BN1L3Z (2SA1511)

MC 14053

C	B	A	ON
L	L	L	Cβ Bβ Aβ
L	H	H	Cβ B1 A1
H	L	L	C1 Bβ Aβ
H	H	H	C1 B1 A1

MC14051

	C	B	A	ON
X*2	L	L	L	X0
I*2	L	L	H	X1
I*2	L	H	L	X2
X*2	L	H	H	X3
V	H	L	L	X4
I	H	L	H	X5
I	H	H	L	X6
I	H	H	H	X7

	R545
WR870: UK WR97ES: US, CANADIAN	3K
WR870 :AEP, GERMANY WR97ES:E	3.6K

IC601
A REC EQ

Q301,401,601
A REC MUTE

A REC LEVEL (L)

A REC LEVEL (R)

Q602–605
A EQ SWITCH

【HP BOARD(1/2)】

IC507
HEADPHONES AMP

IC507 (1/2)
M5218L

IC507 (2/2)
M5218L

RV571
PHONES LEVEL

J501
PHONES

【PJ BOARD】

PJ561
LINE OUT
LINE IN

【DISPLAY BOARD(1/3)】

RV561
REC LEVEL

【REC VOL BOARD(1/2)】

【DOLBY BOA

IC71

【MPX SW BOARD】

TC-WR870
GERMANY MODEL,
TC-WR97ES

S599
MPX FILTER
OFF → ON

Q562
2SA1317

Q161,261,561,562
LINE MUTE

Q161
2SD21445

Q261
2SD21445

Q561
2SA1345

IC602
B REC EQ

Q351,451,651
B REC MUTE

B REC LEVEL (L)

B REC LEVEL (R)

IC603
B EQ SWITCH

Q652–654
B EQ SWITCH

【HP BOARD (2/2)】

RV71
20k 20k
IBM
DUBBING LEVEL

IC75 (1/4)
MC14066BCP

IC75
REC IN SELECT

IC74 (1/4)
MC14066BCP

IC74
REC IN SELECT

IC74,75,76
14P : B+
7P : B-

Q80,81
REC IN SELECT SWITCH

Q82,83
LINE OUT SELECT SWITCH

Q81
2SC3399

Q83
2SC3399

Q78,79
REC IN SELECT SWITCH

Q78
2SA1345

Q79
2SC3399

IC72
NR

IC73
NR

IC508
AMS AMP

IC508 (1/2)
RC4558P

IC508 (2/2)
RC4558P

Q581,582
AMS SWITCH

Q581
2SA1345

Q582
2SC3399

Q653
2SC3399

Q652
2SA1345

Q654
2SA1345

Q651
2SA1345

Q652
2SC3402

IC509 (1/2)
RC4558P

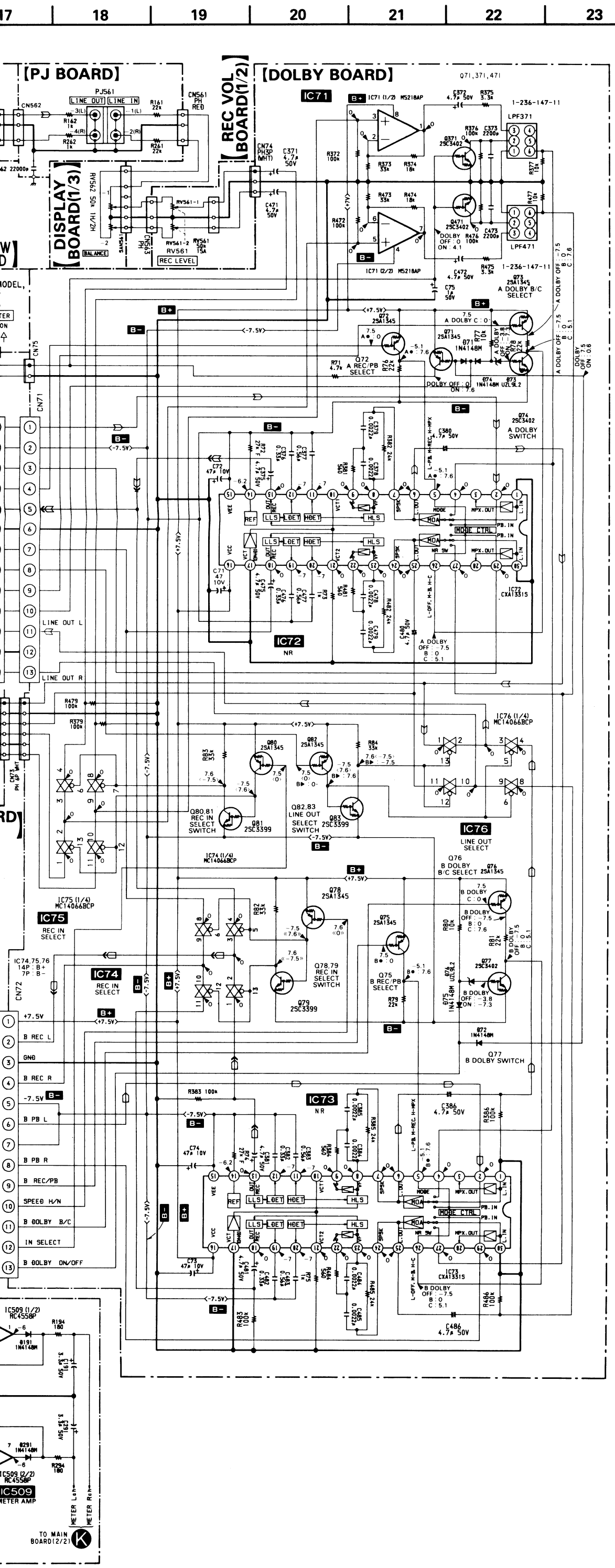
IC509 (2/2)
RC4558P

IC509
METER AMP

MC14051

	C	B	A	ON
IX2	L	L	L	X0
IIX2	L	L	H	X1
IIIX2	L	H	L	X2
IVX2	L	H	H	X3
V	H	L	L	X4
VI	H	L	H	X5
VII	H	H	L	X6
VIII	H	H	H	X7

TO MAIN BOARD(2/2)



Note:

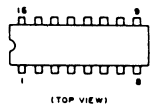
- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- △ : internal component.
- ⏛ : nonflammable resistor.

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

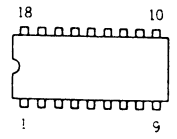
- B+ : B + Line.
- B− : B − Line.
- ▭ : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : STOP
  < > : NORMAL SPEED DUBBING
  ≪ HIGH SPEED DUBBING ≫
- ▶ : FWD ◀ : REV
- Voltages are taken with a VOM (10 MΩ/V).
  Voltage variations may be noted due to normal production tolerances.
- Signal path.
  : PB (DECK A)
  : REC (DECK A)
  : PB (DECK B)
  : REC (DECK B)

• Semiconductor Lead Layouts

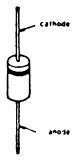
CXA1198AP
MC14053BCP
TC4051BPHB



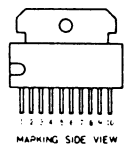
μ PC1297CA



UZL-11H2
10E2N

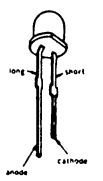


LB1641
BA6219B

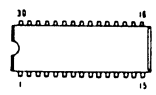


DTA114ES
DTA144ES
DTC114ES
DTC143TS
2SA1317-STU
2SC2603-EF
2SC2144S
2SD2144S

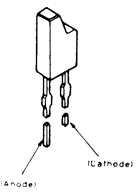
SEL2210S-D



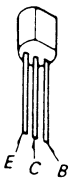
CXA1331S



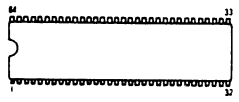
SLR-314D



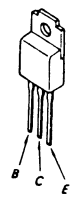
2SB1116A-L
2SC2001-LK



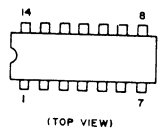
HD614023SA85
M50747-B83SP
M50944-160SP



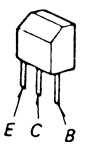
2SB1370-EF



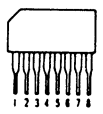
MC14066BCP
μ PD4011BC



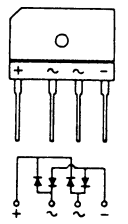
2SD1312-K



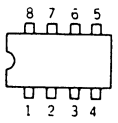
M5218AL



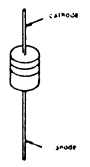
D2SB20



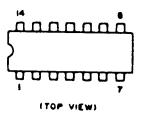
M5218AP
RC4558P
μ PC4570C-1



HZS6A1L
HZS6B3L
HZ6C3L
HZ9A2L
1SS120



TC4071BP



[DISPLAY BOARD(3/3)]

Ref. No.	PANEL DESIGNATION	
S951	BLANK SKIP	
S952	AUTO PAUSE	
S953	AUTO REC LEVEL	
S954	FADER	
S971	A + B REC	
S972	HIGH SPEED	(DUBBING)
S973	NORM SPEED	(DUBBING)
S974	RESET	(COUNTER DECK A)
S975	MEMORY	(COUNTER DECK A)
S976	RESET	(COUNTER DECK B)
S977	MEMORY	(COUNTER DECK B)
S981	EJECT	
S982	STOP	
S983	FWD	(DECK A)
S984	REV	
S985	PAUSE	
S986	REC MUTE	
S987	REW	
S988	FF	
S989	REC	
S991	EJECT	
S992	STOP	(DECK B)
S993	FWD	
S994	REV	
S995	PAUSE	
S996	REC MUTE	
S997	REW	
S998	FF	(DECK A)
S999	REC	

【TRANSLATION BOARD (B)(2/2)】

【SENSOR BOARD(B)】

TCM-200R4

【SENSOR BOARD(A)】

【TRANSLATION BOARD (A)(2/2)】

Q1091-A/B QUICK SENSOR

IC803 REC LEVEL VOL MOTOR CONTROL

【REC VOL BOARD(2/2)】

IC802 MECHANISM CONTROLLER

IC804 S/T REEL SIGNAL BUFFER

IC807 REEL MOTOR DRIVE

IC808 ASSIST MOTOR DRIVE

Q885 MOTOR CONTROL

Q883,884 MOTOR CONTROL

Q831,832 SHAPER

Q841,842 SHAPER

TO MAIN BOARD(1/2)

Q704,705 +5V REG.

Q702,703 +11V REG.

Q707 2SB1116A Q706,707 −28V REG.

APPLICABLE TO THE END OF THE MAIN BOARD PART NO. −11 OR −12

APPLICABLE TO THE END OF THE MAIN BOARD PART NO. −13

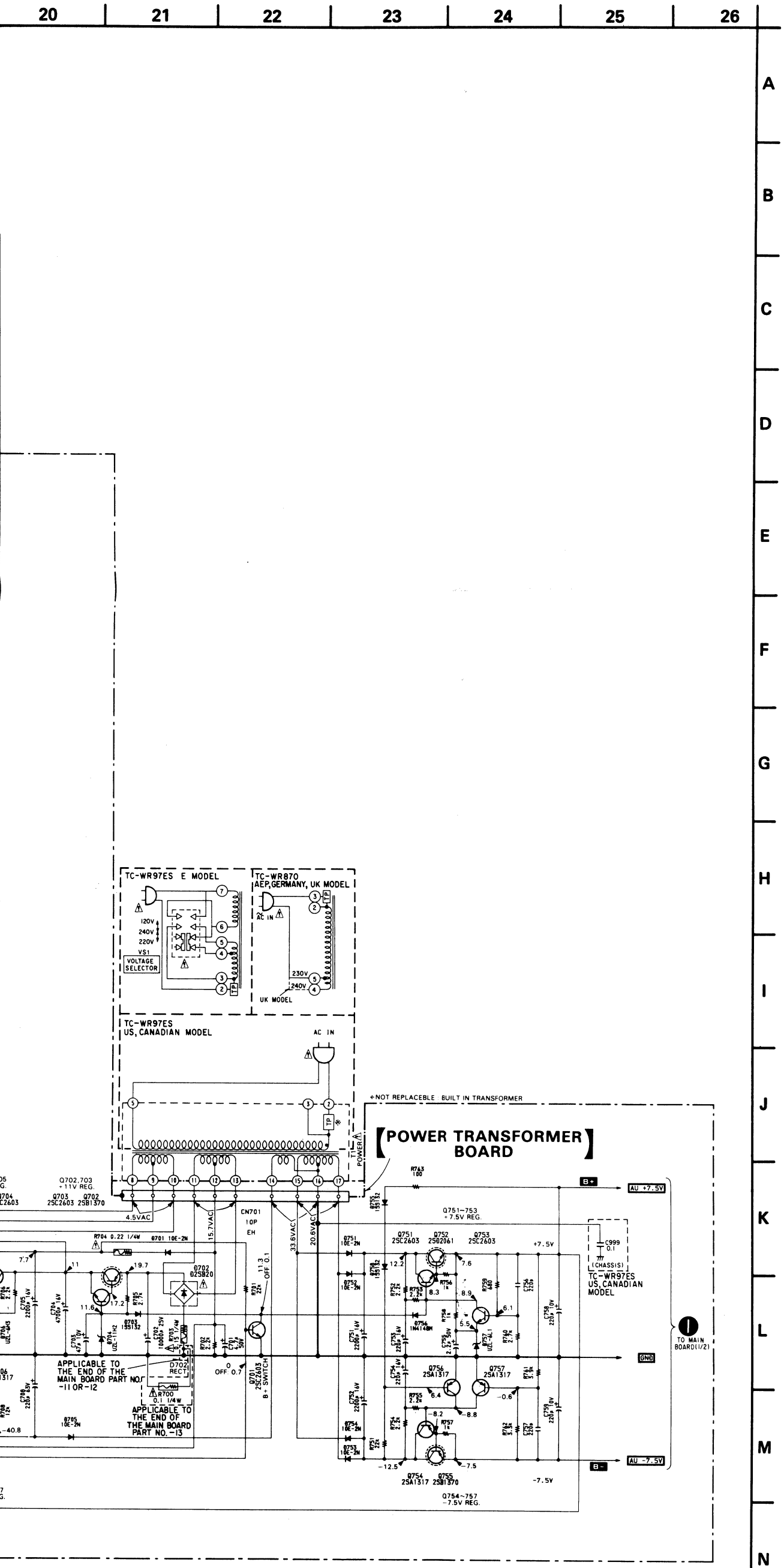
TC-WR97ES E MODEL

TC-WR870 AEP, GERMANY, UK M

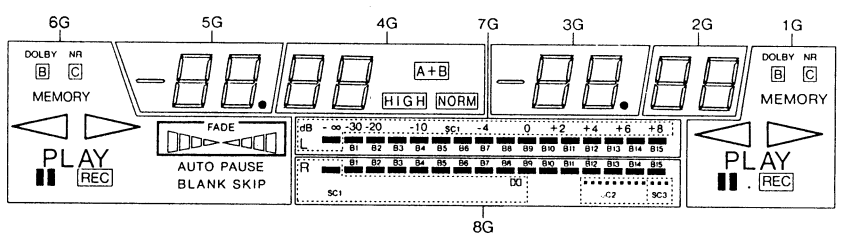
TC-WR97ES US, CANADIAN MODEL

【MD BOARD(B)】

TCM-200R4

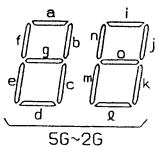


• FL 901 Internal Connection



ANODE CONNECTION

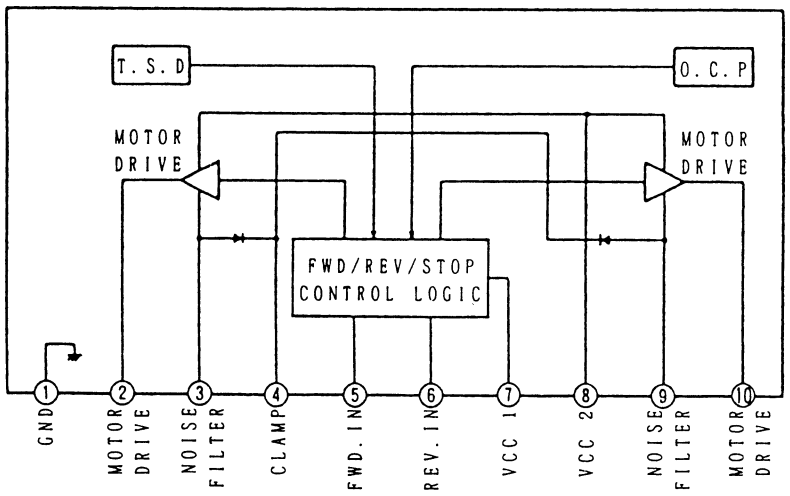
	8G	7G	6G	5G	4G	3G	2G	1G
a	SC1	SC1	DOLBY NR	a	a	a	a	DOLBY NR
b	(B1)	(B1)	B	b	b	b	b	B
c	(B4)	(B4)	◁	c	c	c	c	◁
d	(B6)	(B6)	PLAY	d	d	d	d	PLAY
e	(B5)	(B5)	▷	e	e	e	e	▷
f	(B2)	(B2)	C	f	f	f	f	C
g	(B3)	(B3)	MEMORY	g	g	g	g	MEMORY
h	(B7)	(B7)	❙❙	—	–	—	–	❙❙
i	(B8)	(B8)	REC	i	i	i	i	REC
j	(B9)	(B9)	FADE	j	j	j	j	–
k	(B12)	(B12)	◁❙❙	k	k	k	k	–
l	(B14)	(B14)	BLANK SKIP	l	l	l	l	–
m	(B13)	(B13)	AUTOPAUSE	m	m	m	m	–
n	(B10)	(B10)	❙▷	n	n	n	n	–
o	(B11)	(B11)	–	o	o	o	o	–
p	(B15)	(B15)	–	• (DP)	A+B	• (DP)	–	–
q	SC3	–	–	–	HIGH	–	–	–
r	SC2	–	–	–	NORM	–	–	–



• IC Block Diagram

IC805, 807 BA6219B

IC803, 806, 808 LB1641



SECTION 5
EXPLODED VIEWS

NOTE:

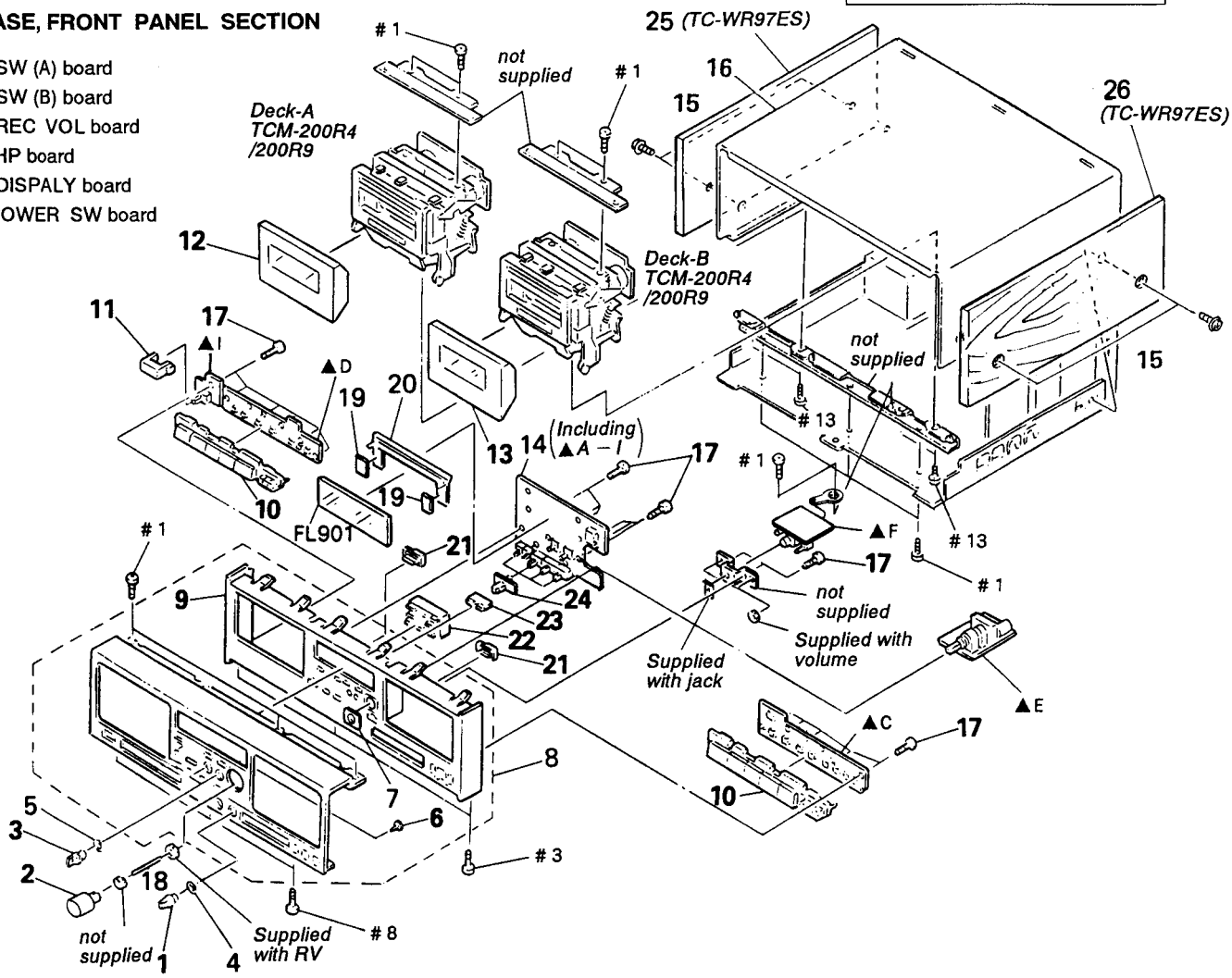
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le neméro spécifié.

(1) CASE, FRONT PANEL SECTION

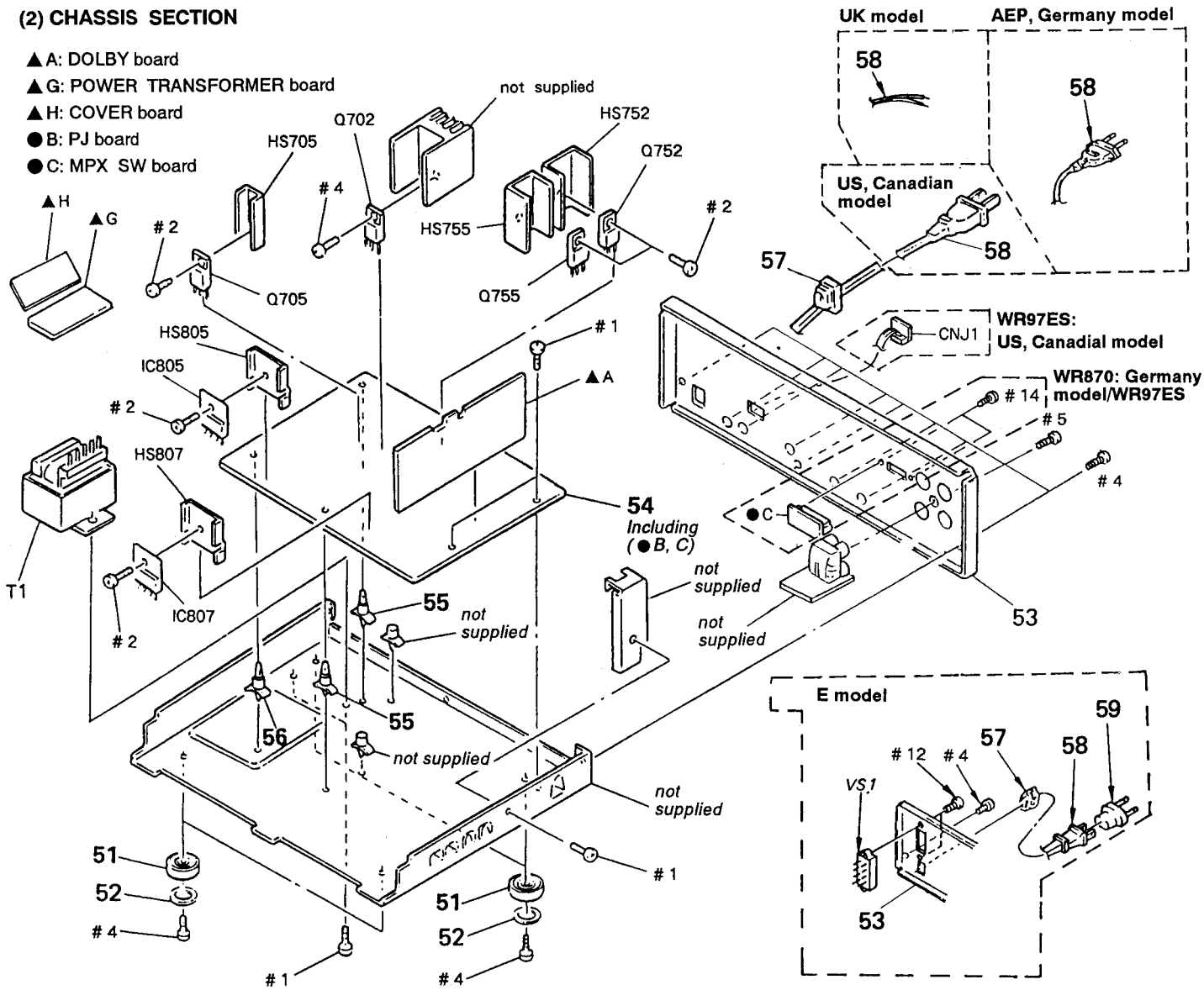
▲D: SW (A) board
▲C: SW (B) board
▲E: REC VOL board
▲F: HP board
▲B: DISPALY board
▲I: POWER SW board



Ref. No.	Part No.	Description	Remark
1	3-354-931-01	KNOB (DIA. 10)	
2	3-329-983-01	KNOB (REC)	
3	3-354-931-11	KNOB (DIA. 10)	
4	3-356-935-01	SPRING	
5	3-354-981-01	SPRING (SUS), RING	
6	3-354-924-01	PLATE, INDICATION	
7	3-354-923-01	PLATE (VOL), ORNAMENTAL	
8	A-2003-900-A	PANEL ASSY, FRONT (WR97ES)	
8	A-2003-726-A	PANEL ASSY, FRONT (WR870)	
8	A-2003-719-A	PANEL ASSY, FRONT (WR97ES:US, Canadian)	
9	3-354-916-01	PANEL (BASE)	
10	3-365-419-01	BUTTON (A)	
11	3-354-932-01	BUTTON (POWER)	
12	X-3362-816-1	LID (A) ASSY, CASSETTE	
13	X-3362-817-1	LID (B) ASSY, CASSETTE	
14	* A-2006-395-A	PANEL BOARD, COMPLETE (WR870:UK)	
14	* A-2006-534-A	PANEL BOARD, COMPLETE (WR97ES:US, Canadian)	
14	* A-2006-546-A	PANEL BOARD, COMPLETE (WR870:Germany/WR97ES:E)	
14	* A-2006-615-A	PANEL BOARD, COMPLETE (WR870: AEP)	
15	4-933-446-01	SCREW (SIDE PANEL)	
16	4-925-039-61	CASE	
17	4-928-635-01	SCREW, +BV (2.6X8) TAPPING	
18	4-922-979-01	INDICATOR	
19	9-911-844-XX	CUSHION	
20	3-365-420-01	HOLDER, FL TUBE	
21	3-354-930-01	BUTTON (D)	
22	3-354-938-21	BUTTON (B)	
23	3-354-929-01	BUTTON (C)	
24	4-922-518-01	KNOB (TIMER)	
25	X-3340-187-1	PANEL (L) ASSY, SIDE	
26	X-3340-188-1	PANEL (R) ASSY, SIDE	
FL901	1-519-594-11	INDICATOR TUBE, FLUORESCENT	

(2) CHASSIS SECTION

▲A: DOLBY board
▲G: POWER TRANSFORMER board
▲H: COVER board
●B: PJ board
●C: MPX SW board

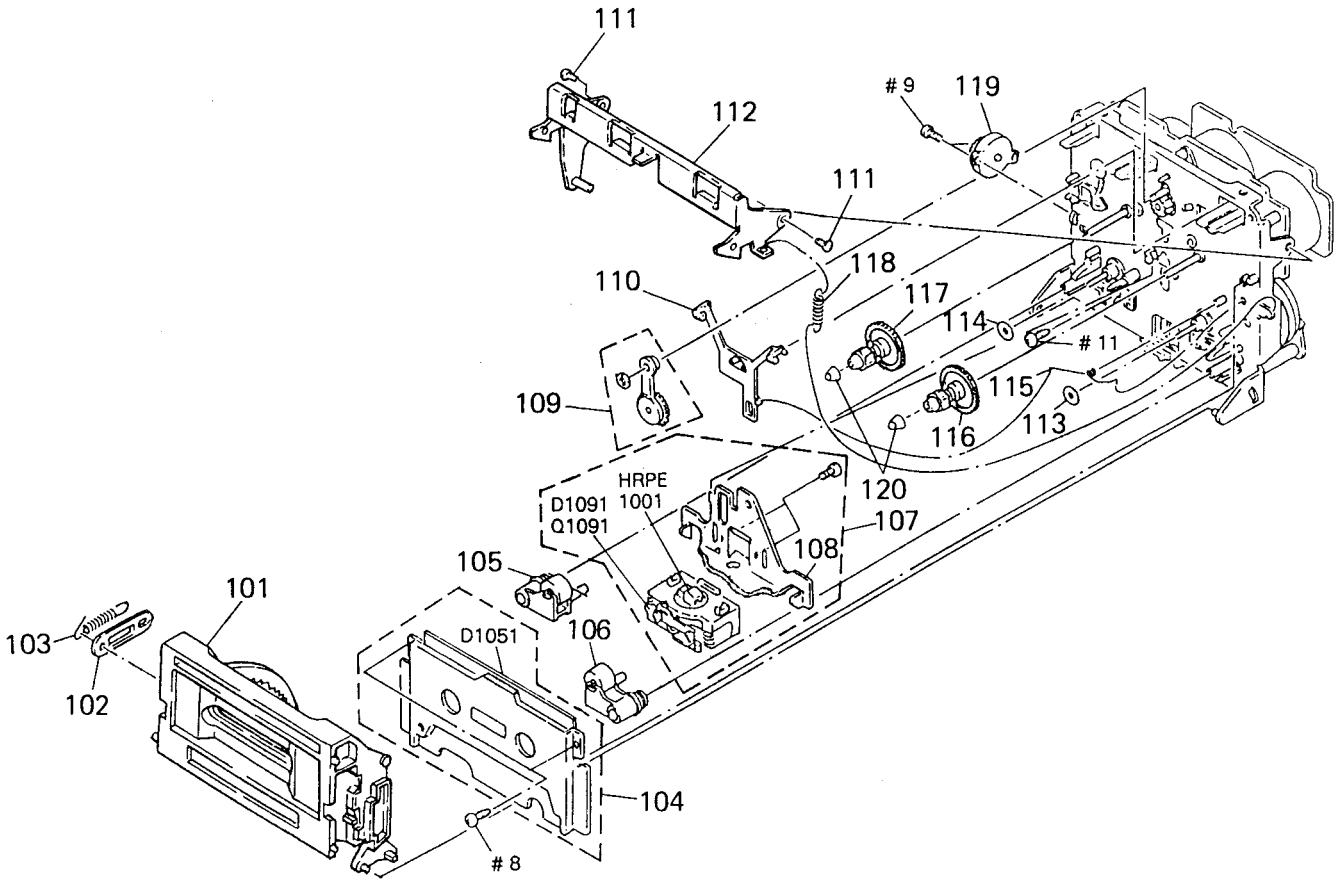


Ref. No.	Part No.	Description	Remark
51	X-3304-938-2	FOOT ASSY	
52	4-923-836-11	CUSHION	
53	* 3-365-368-11	PANEL, BACK (WR97ES:US, Canadian)	
53	* 3-365-368-21	PANEL, BACK (WR870:Germany)	
53	* 3-365-368-31	PANEL, BACK (WR870:UK)	
53	* 3-365-368-41	PANEL, BACK (WR870:AEP)	
53	* 3-365-368-51	PANEL, BACK (WR870:AEP)	
53	* 3-365-368-61	PANEL, BACK (WR97ES:E)	
54	* A-2006-535-A	MAIN BOARD, COMPLETE (WR870:Germany/WR97ES:E)	
54	* A-2006-394-A	MAIN BOARD, COMPLETE (WR870:UK)	
54	* A-2006-390-A	MAIN BOARD, COMPLETE (WR97ES:US, Canadian)	
54	* A-2006-616-A	MAIN BOARD, COMPLETE (WR870: AEP)	
55	* 3-346-265-11	HOLDER, PC BOARD	
56	* 4-924-098-11	HOLDER, PC BOARD	
57	* 3-703-571-11	BUSHING (S) (4516), CORD (WR97ES:E)	
57	* 3-703-244-00	BUSHING (2104), CORD	?
58	⚠ 1-555-465-00	CORD, POWER (WR97ES:US, Canadian)	
59	⚠ 1-569-007-11	ADAPTOR, CONVERSION 2P (WR97ES:E)	
CNJ1	1-558-350-21	CORD (WITH CONNECTOR) (WR97ES:US, Canadian)	
HS705	* 3-309-144-21	HEAT SINK	
HS752	* 4-880-403-11	HEAT SINK	
HS755	* 4-880-403-11	HEAT SINK	
HS805	* 3-356-925-01	HEAT SINK	
HS807	* 3-356-925-01	HEAT SINK	
T1	⚠ 1-450-446-11	TRANSFORMER, POWER (WR870)	
T1	⚠ 1-450-445-11	TRANSFORMER, POWER (WR97ES:E)	
T1	⚠ 1-450-444-11	TRANSFORMER, POWER (WR97ES:US, Canadian)	
VS1	⚠ 1-570-307-11	SWITCH, VOLTAGE CHANGE (VOLTAGE SELECTOR) (WR97ES:E)	

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le neméro spécifié.

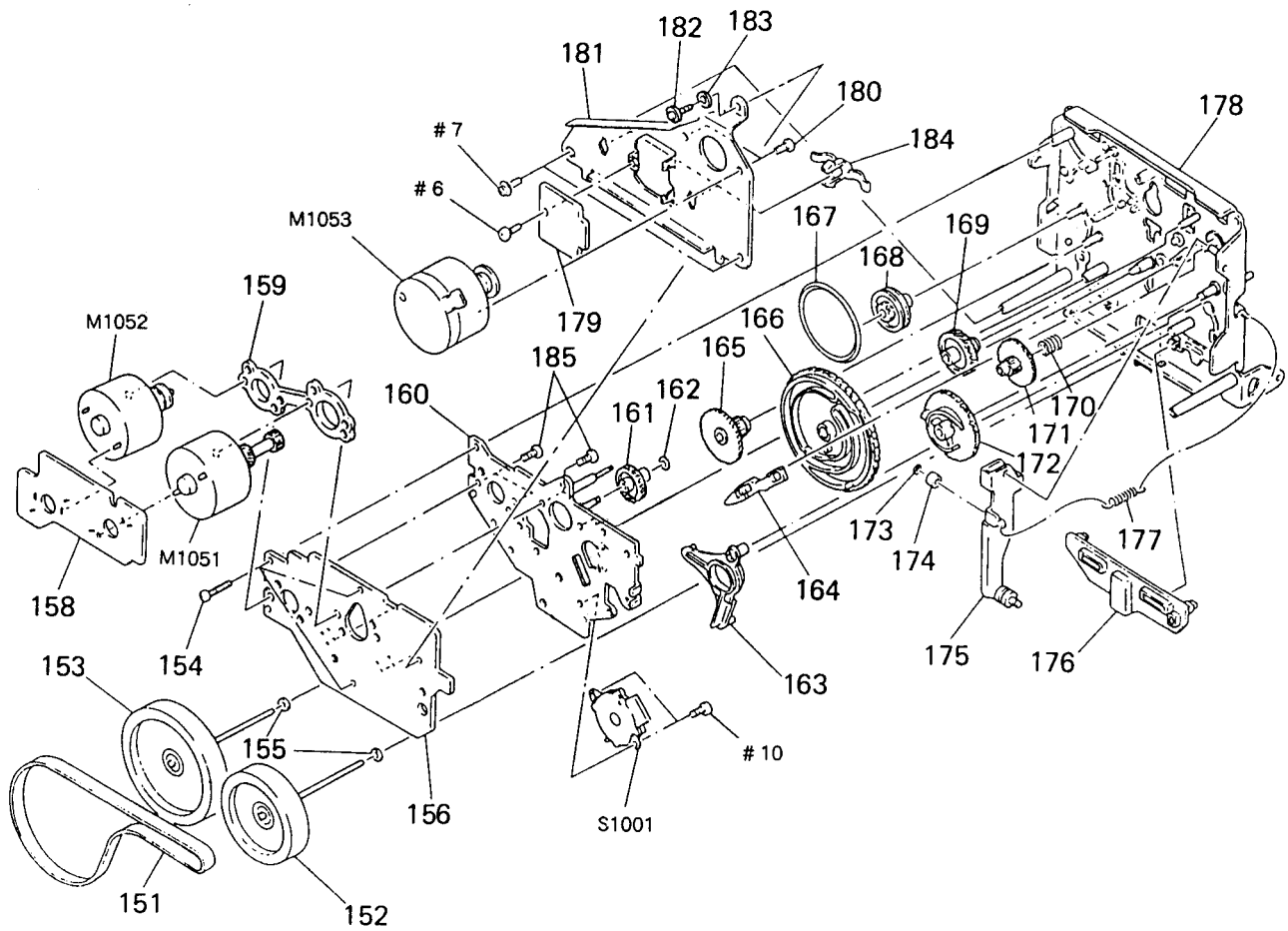
(3) MECHANISM DECK SECTION 1
TCM-200R4: TC-WR97ES; US, Canadian
TCM-200R9: (TC-WR97ES; E
(TC-WR870; AE, UK Germany)



Ref. No.	Part No.	Description	Remark
101	X-3362-814-4	HOLDER (CD) ASSY, CASSETTE	
102	* 3-356-717-01	LEVER (JOINT)	
103	3-356-626-01	SPRING, TENSION	
104	X-3356-613-1	PLATE ASSY, ORNAMENTAL	
105	X-3343-456-1	LEVER (PINCH R) ASSY	
106	X-3343-455-1	LEVER (PINCH F) ASSY	
107	A-2003-722-A	SLIDER (R4) COMPLETE ASSY (TCM-200R4)	
107	A-2003-901-A	SLIDER (R9) COMPLETE ASSY (TCM-200R9)	
108	X-3362-819-2	SLIDER (HEAD CHASSIS R) ASSY	
109	X-3356-641-1	LEVER (FR2) ASSY	
110	3-356-614-01	SLIDER (BRAKE)	
111	3-356-601-11	SCREW, STEP	
112	* X-3356-608-1	LEVER (LIFTER) ASSY	

Ref. No.	Part No.	Description	Remark
113	3-356-713-01	WASHER	
114	3-356-714-01	WASHER	
115	3-356-619-01	SPRING (B), TORSION	
116	X-3356-627-1	GEAR (T) ASSY	
117	X-3356-628-1	GEAR (S) ASSY	
118	3-356-625-01	SPRING, TENSION	
119	3-319-224-31	DAMPER, SMALL	
120	3-362-308-01	CAP (REEL)	
D1051	8-719-980-85	DIODE SLF-325C	
D1091	8-719-950-74	DIODE SLR-314D-B	
Q1091	8-729-809-43	SPS-314B-BE	

(4) MECHANISM DECK SECTION 2
(TCM-200R4: TC-WR97ES; US, Canadian Model)
(TCM-200R9: TC-WR870, TC-WR97ES; E Model)



Ref. No.	Part No.	Description	Remark
151	3-356-604-01	BELT (CAPSTAN)	
152	X-3356-642-1	FLYWHEEL (R FWD) ASSY	
153	X-3356-643-1	FLYWHEEL (R REV) ASSY	
154	3-355-801-01	SCREW (BTP 2X18)	
155	3-356-705-01	WASHER (CAPSTAN)	
156	* 1-632-740-11	MD BOARD	
158	* 1-632-741-11	REEL MOTOR BOARD	
159	* 3-356-628-01	SPACER (MOTOR)	
160	* X-3356-602-4	BRACKET (MOTOR R) ASSY	
161	3-356-702-01	GEAR (COMMUNICATION B)	
162	3-669-465-00	WASHER (1.5), STOPPER	
163	3-356-613-01	LEVER (MODE)	
164	3-356-617-01	LEVER (SELECTION)	
165	3-356-606-01	GEAR (MODE)	
166	3-356-615-01	GEAR (MODE CAM RR)	
167	3-356-603-01	BELT (MODE)	
168	3-356-607-01	PULLEY (MODE)	
169	3-356-703-01	GEAR (COMMUNICATION C)	
170	3-356-605-01	SPRING, COMPRESSION	

Ref. No.	Part No.	Description	Remark
171	3-356-609-01	GEAR (LOADING)	
172	3-356-616-01	GEAR (LOADING CAM)	
173	3-558-708-11	WASHER, STOPPER	
174	3-356-630-01	ROLLER (LOADING)	
175	* X-3356-606-1	LEVER (LOADING) ASSY	
176	3-356-612-01	SLIDER (REVERSE)	
177	3-356-624-01	SPRING, TENSION	
178	X-3356-634-1	CHASSIS (R2) COMPLETE ASSY, MECH	
179	* 1-634-323-11	TRANSLATION BOARD	
180	4-885-599-00	SCREW, FITTING, REINFORCEMENT	
181	* 3-356-629-01	BRACKET (THRUST RETAINER R)	
182	3-356-707-01	SCREW (+PTPWH 2X25)	
183	* 3-356-718-01	SPACER (THRUST RETAINER R)	
184	3-575-321-00	RETAINER, THRUST, CAPSTAN	
185	3-363-804-01	SCREW (+P 2.6X6.5)	
M1051	X-3356-638-1	MOTOR (REEL R) ASSY	
M1052	X-3356-604-1	MOTOR (ASSIST) ASSY	
M1053	X-3356-605-1	MOTOR (CAPSTAN R) ASSY	
S1001	1-466-525-11	ENCODER, ROTARY	

SECTION 6
ELECTRICAL PARTS LIST

TRANSLATION

MD **MAIN**

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le neméro spécifié.

When including parts by reference number, please include the board name.

Ref. No.	Part No.	Description	Remark
	* 1-634-323-11	TRANSLATION BOARD	
		**********	
		< CONNECTOR >	
CN1091	* 1-564-709-11	PIN, CONNECTOR (SMALL TYPE) 7P	
CN1092	* 1-564-509-11	PLUG, CONNECTOR 6P	
CN1093	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P	
CN1094	* 1-564-506-11	PLUG, CONNECTOR 3P	
**********			
	* 1-632-740-11	MD BOARD	
		********	
	3-356-631-01	HOLDER (SENSOR)	
		< CONNECTOR >	
CN1001	1-506-615-11	PIN, CONNECTOR 9P	
CN1002	* 1-564-502-11	PIN, CONNECTOR 10P	
		< IC >	
IC1001	8-749-920-97	IC PHOTO REFLECTOR GP2S22B	
IC1002	8-749-920-97	IC PHOTO REFLECTOR GP2S22B	
		< RESISTOR >	
R1001	1-249-408-11	CARBON 180 5% 1/4W	
R1002	1-249-408-11	CARBON 180 5% 1/4W	
		< SWITCH >	
S1002	1-570-953-11	SWITCH, PUSH (1 KEY)	
S1003	1-571-958-11	SWITCH, PUSH (1 KEY)	
S1004	1-572-126-11	SWITCH, PUSH (1 KEY)	
S1005	1-572-125-11	SWITCH, LEAF	
S1006	1-572-202-11	SWITCH, LEAF	
S1007	1-572-125-11	SWITCH, LEAF	
S1008	1-572-125-11	SWITCH, LEAF	
S1009	1-572-125-11	SWITCH, LEAF	
		< CONNECTOR >	
TB1001	* 1-569-066-11	PIN, CONNECTOR 5P	
**********			
	* A-2006-390-A	MAIN BOARD, COMPLETE	
		**********	
		(WR97ES: US, Canadian)	
	* A-2006-394-A	MAIN BOARD, COMPLETE	
		**********	
		(WR870: UK)	
	* A-2006-535-A	MAIN BOARD, COMPLETE	
		**********	
		(WR870: Germany/WR97ES: E)	
	* A-2006-616-A	MAIN BOARD, COMPLETE	
		**********	
		(WR870: AEP)	
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
	7-682-548-04	SCREW +BVTT 3X8 (S)	
		< CAPACITOR >	
C121	1-136-153-00	FILM 0.01uF 5% 50V	
C122	1-136-157-00	FILM 0.022uF 5% 50V	
C123	1-136-161-00	FILM 0.047uF 5% 50V	
C124	1-136-272-00	FILM 68PF 5% 630V	
C125	1-136-433-11	FILM 100PF 5% 630V	
C126	1-130-468-00	MYLAR 560PF 5% 50V	
C131	1-136-935-11	FILM 22PF 5% 630V	
C132	1-162-285-31	CERAMIC 180PF 10% 50V	
C133	1-130-469-00	MYLAR 680PF 5% 50V	
C134	1-136-157-00	FILM 0.022uF 5% 50V	
C135	1-124-657-00	ELECT 10uF 20% 50V	
C136	1-136-158-00	FILM 0.027uF 5% 50V	
C141	1-136-153-00	FILM 0.01uF 5% 50V	
C142	1-136-157-00	FILM 0.022uF 5% 50V	
C143	1-136-161-00	FILM 0.047uF 5% 50V	

MAIN

Ref. No.	Part No.	Description			Remark
C144	1-136-272-00	FILM	68PF	5%	630V
C145	1-136-433-11	FILM	100PF	5%	630V
C146	1-130-468-00	MYLAR	560PF	5%	50V
C151	1-136-935-11	FILM	22PF	5%	630V
C152	1-162-285-31	CERAMIC	180PF	10%	50V
C153	1-130-469-00	MYLAR	680PF	5%	50V
C154	1-136-157-00	FILM	0.022uF	5%	50V
C155	1-124-657-00	ELECT	10uF	20%	50V
C156	1-136-158-00	FILM	0.027uF	5%	50V
C191	1-123-382-00	ELECT	3.3uF	20%	100V
C221	1-136-153-00	FILM	0.01uF	5%	50V
C222	1-136-157-00	FILM	0.022uF	5%	50V
C223	1-136-161-00	FILM	0.047uF	5%	50V
C224	1-136-272-00	FILM	68PF	5%	630V
C225	1-136-433-11	FILM	100PF	5%	630V
C226	1-130-468-00	MYLAR	560PF	5%	50V
C231	1-136-935-11	FILM	22PF	5%	630V
C232	1-162-285-31	CERAMIC	180PF	10%	50V
C233	1-130-469-00	MYLAR	680PF	5%	50V
C234	1-136-157-00	FILM	0.022uF	5%	50V
C235	1-124-657-00	ELECT	10uF	20%	50V
C236	1-136-158-00	FILM	0.027uF	5%	50V
C241	1-136-153-00	FILM	0.01uF	5%	50V
C242	1-136-157-00	FILM	0.022uF	5%	50V
C243	1-136-161-00	FILM	0.047uF	5%	50V
C244	1-136-272-00	FILM	68PF	5%	630V
C245	1-136-433-11	FILM	100PF	5%	630V
C246	1-130-468-00	MYLAR	560PF	5%	50V
C251	1-136-935-11	FILM	22PF	5%	630V
C252	1-162-285-31	CERAMIC	180PF	10%	50V
C253	1-130-469-00	MYLAR	680PF	5%	50V
C254	1-136-157-00	FILM	0.022uF	5%	50V
C255	1-124-657-00	ELECT	10uF	20%	50V
C256	1-136-158-00	FILM	0.027uF	5%	50V
C291	1-123-382-00	ELECT	3.3uF	20%	100V
C301	1-124-902-00	ELECT	0.47uF	20%	50V
C303	1-124-927-11	ELECT	4.7uF	20%	100V
C304	1-124-927-11	ELECT	4.7uF	20%	100V
C351	1-124-902-00	ELECT	0.47uF	20%	50V
C353	1-124-927-11	ELECT	4.7uF	20%	100V
C354	1-124-927-11	ELECT	4.7uF	20%	100V
C401	1-124-902-00	ELECT	0.47uF	20%	50V
C403	1-124-927-11	ELECT	4.7uF	20%	100V
C404	1-124-927-11	ELECT	4.7uF	20%	100V
C451	1-124-902-00	ELECT	0.47uF	20%	50V
C453	1-124-927-11	ELECT	4.7uF	20%	100V
C454	1-124-927-11	ELECT	4.7uF	20%	100V
C521	1-124-925-11	ELECT	2.2uF	20%	100V
C522	1-124-902-00	ELECT	0.47uF	20%	50V

Ref. No.	Part No.	Description			Remark
C523	1-136-230-00	FILM	0.0022uF	5%	100V
C524	1-136-230-00	FILM	0.0022uF	5%	100V
C525	1-130-856-00	FILM	0.0068uF	5%	100V
C526	1-124-907-11	ELECT	10uF	20%	50V
C527	1-136-558-11	FILM	0.0039uF	5%	630V
C528	1-124-477-11	ELECT	47uF	20%	25V
C529	1-124-477-11	ELECT	47uF	20%	25V
C530	1-107-046-00	MICA	4.7PF		500V
C535	1-126-176-11	ELECT	220uF	20%	10V
C536	1-126-176-11	ELECT	220uF	20%	10V
C541	1-124-925-11	ELECT	2.2uF	20%	100V
C542	1-124-902-00	ELECT	0.47uF	20%	50V
C543	1-136-230-00	FILM	0.0022uF	5%	100V
C544	1-136-230-00	FILM	0.0022uF	5%	100V
C545	1-130-856-00	FILM	0.0068uF	5%	100V
C546	1-124-907-11	ELECT	10uF	20%	50V
C547	1-136-558-11	FILM	0.0039uF	5%	630V
C548	1-124-477-11	ELECT	47uF	20%	25V
C549	1-124-477-11	ELECT	47uF	20%	25V
C550	1-107-046-00	MICA	4.7PF		500V
C555	1-126-176-11	ELECT	220uF	20%	10V
C556	1-126-176-11	ELECT	220uF	20%	10V
C561	1-124-120-11	ELECT	220uF	20%	25V
C562	1-161-494-00	CERAMIC	0.022uF		25V
C581	1-124-925-11	ELECT	2.2uF	20%	100V
C582	1-162-217-31	CERAMIC	56PF	5%	50V
C583	1-136-157-00	FILM	0.022uF	5%	50V
C585	1-162-286-31	CERAMIC	220PF	10%	50V
C586	1-124-925-11	ELECT	2.2uF	20%	100V
C587	1-124-925-11	ELECT	2.2uF	20%	100V
C601	1-124-903-11	ELECT	1uF	20%	50V
C651	1-124-903-11	ELECT	1uF	20%	50V
C701	1-124-927-11	ELECT	4.7uF	20%	100V
C702	1-124-772-11	ELECT	10000uF	20%	25V
C703	1-124-126-00	ELECT	47uF	20%	10V
C704	1-124-898-11	ELECT	4700uF	20%	16V
C705	1-124-556-11	ELECT	2200uF	20%	16V
C706	1-124-443-00	ELECT	100uF	20%	10V
C707	1-124-471-00	ELECT	1000uF	20%	6.3V
C708	1-124-919-11	ELECT	220uF	20%	63V
C709	1-124-927-11	ELECT	4.7uF	20%	100V
C710	1-124-927-11	ELECT	4.7uF	20%	100V
C751	1-124-556-11	ELECT	2200uF	20%	16V
C752	1-124-556-11	ELECT	2200uF	20%	16V
C753	1-124-120-11	ELECT	220uF	20%	25V
C754	1-124-120-11	ELECT	220uF	20%	25V
C755	1-124-925-11	ELECT	2.2uF	20%	100V
C756	1-162-286-31	CERAMIC	220PF	10%	50V
C757	1-162-286-31	CERAMIC	220PF	10%	50V

Ref. No.	Part No.	Description			Remark
C758	1-126-176-11	ELECT	220uF	20%	10V
C759	1-126-176-11	ELECT	220uF	20%	10V
C802	1-164-159-11	CERAMIC	0.1uF		50V
C803	1-161-494-00	CERAMIC	0.022uF		25V
C804	1-162-306-11	CERAMIC	0.01uF	20%	16V
C805	1-124-925-11	ELECT	2.2uF	20%	100V
C806	1-164-159-11	CERAMIC	0.1uF		50V
C807	1-164-159-11	CERAMIC	0.1uF		50V
C811	1-126-233-11	ELECT	22uF	20%	50V
C831	1-124-927-11	ELECT	4.7uF	20%	100V
C832	1-124-477-11	ELECT	47uF	20%	25V
C833	1-130-479-00	MYLAR	0.0047uF	5%	50V
C841	1-124-927-11	ELECT	4.7uF	20%	100V
C842	1-124-477-11	ELECT	47uF	20%	25V
C843	1-130-479-00	MYLAR	0.0047uF	5%	50V
C851	1-124-443-00	ELECT	100uF	20%	10V
C871	1-164-159-11	CERAMIC	0.1uF		50V
C872	1-164-159-11	CERAMIC	0.1uF		50V
C881	1-164-159-11	CERAMIC	0.1uF		50V
C882	1-164-159-11	CERAMIC	0.1uF		50V
C898	1-164-159-11	CERAMIC	0.1uF		50V (WR97ES:US, Canadian)
		< CONNECTOR >			
CN541	* 1-568-951-11	PIN, CONNECTOR 2P			
CN561	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P			
CN562	* 1-564-337-00	PIN, CONNECTOR 3P			
CN571	* 1-564-707-11	PIN, CONNECTOR (SMALL TYPE) 5P			
CN601	* 1-566-220-11	PIN, CONNECTOR 13P			
CN602	* 1-566-220-11	PIN, CONNECTOR 13P			
CN701	* 1-564-513-11	PLUG, CONNECTOR 10P			
CN801	* 1-568-955-11	PIN, CONNECTOR 6P			
CN802	* 1-568-935-11	PIN, CONNECTOR 8P			
CN803	* 1-568-953-11	PIN, CONNECTOR 4P			
CN804	* 1-568-953-11	PIN, CONNECTOR 4P			
CN805	* 1-568-953-11	PIN, CONNECTOR (STRAIGHT) 4P			
CN806	* 1-564-340-00	PIN, CONNECTOR 6P			
CN807	1-565-951-11	SOCKET, CONNECTOR (PC BOARD) 4P (WR97ES:US, Canadian)			
		< CIRCUIT BLOCK >			
CP851	1-233-199-11	COMPOSITION CIRCUIT BLOCK			
CP852	1-233-199-11	COMPOSITION CIRCUIT BLOCK			
		< DIODE >			
D191	8-719-912-20	DIODE 1SS120			
D291	8-719-912-20	DIODE 1SS120			
D521	8-719-912-20	DIODE 1SS120			
D522	8-719-912-20	DIODE 1SS120			
D541	8-719-912-20	DIODE 1SS120			
D542	8-719-912-20	DIODE 1SS120			
D561	8-719-912-20	DIODE 1SS120			
D601	8-719-912-20	DIODE 1SS120			
D602	8-719-912-20	DIODE 1SS120			
D701	8-719-200-77	DIODE 10E2N			
D702	8-719-500-36	DIODE D2SB20			
D703	8-719-912-20	DIODE 1SS120			
D704	8-719-001-54	DIODE UZL-11H2			
D705	8-719-200-77	DIODE 10E2N			
D706	8-719-933-41	DIODE HZS6C3L			
D707	8-719-912-20	DIODE 1SS120			
D708	8-719-933-38	DIODE HZS6C3L			
D751	8-719-200-77	DIODE 10E2N			
D752	8-719-200-77	DIODE 10E2N			
D753	8-719-200-77	DIODE 10E2N			
D754	8-719-200-77	DIODE 10E2N			
D755	8-719-912-20	DIODE 1SS120			
D756	8-719-912-20	DIODE 1SS120			
D757	8-719-933-33	DIODE HZS6A1L			
D758	8-719-912-20	DIODE 1SS120			
D801	8-719-912-20	DIODE 1SS120			
D802	8-719-912-20	DIODE 1SS120			
D804	8-719-912-20	DIODE 1SS120			
D805	8-719-912-20	DIODE 1SS120			
D831	8-719-912-20	DIODE 1SS120			
D841	8-719-912-20	DIODE 1SS120			
D890	8-719-912-20	DIODE 1SS120			(WR97ES:US, Canadian)
D891	8-719-912-20	DIODE 1SS120			(WR97ES:US, Canadian)
		< HEAT SINK >			
HS705	* 3-309-144-21	HEAT SINK			
HS752	* 4-880-403-11	HEAT SINK			
HS755	* 4-880-403-11	HEAT SINK			
HS805	* 3-356-925-01	HEAT SINK			
HS807	* 3-356-925-01	HEAT SINK			
		< IC >			
IC501	8-759-106-56	IC uPC1297CA			
IC502	8-759-106-56	IC uPC1297CA			
IC503	8-759-111-44	IC uPC4570C-1			
IC504	8-759-111-44	IC uPC4570C-1			
IC506	8-759-140-53	IC MC14053BCP			
IC508	8-759-945-58	IC RC4558P			
IC509	8-759-945-58	IC RC4558P			
IC601	8-752-038-02	IC CXA1198AP			
IC602	8-752-038-02	IC CXA1198AP			
IC603	8-759-208-06	IC TC4051BPHB			

MAIN

Ref. No.	Part No.	Description	Remark
IC801	8-759-636-40	IC M50944-169SP	
IC802	8-759-633-86	IC M50747-B83SP	
IC803	8-759-822-09	IC LB1641	
IC804	8-759-240-71	IC TC4071BP	
IC805	8-759-973-95	IC BA6219B	
IC806	8-759-822-09	IC LB1641	
IC807	8-759-973-95	IC BA6219B	
IC808	8-759-822-09	IC LB1641	
IC809	8-759-140-11	IC uPD4011BC (WR97ES:US, Canadian)	
		< COIL >	
L131	1-410-780-11	INDUCTOR 27mH	
L151	1-410-780-11	INDUCTOR 27mH	
L231	1-410-780-11	INDUCTOR 27mH	
L251	1-410-780-11	INDUCTOR 27mH	
		< JACK >	
PJ561	1-573-070-11	JACK, PIN 4P (LINE IN/OUT)	
		< TRANSISTOR >	
Q131	8-729-900-74	TRANSISTOR DTC143TS	
Q151	8-729-900-74	TRANSISTOR DTC143TS	
Q161	8-729-922-37	TRANSISTOR 2SD2144S-UVW	
Q231	8-729-900-74	TRANSISTOR DTC143TS	
Q251	8-729-900-74	TRANSISTOR DTC143TS	
Q261	8-729-922-37	TRANSISTOR 2SD2144S-UVW	
Q301	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q351	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q401	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q451	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q521	8-729-900-65	TRANSISTOR DTA144ES	
Q522	8-729-900-65	TRANSISTOR DTA144ES	
Q523	8-729-900-61	TRANSISTOR DTA114ES	
Q524	8-729-900-89	TRANSISTOR DTC144ES	
Q525	8-729-900-89	TRANSISTOR DTC144ES	
Q526	8-729-900-80	TRANSISTOR DTC114ES	
Q527	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q528	8-729-142-46	TRANSISTOR 2SC2001-LK	
Q529	8-729-142-46	TRANSISTOR 2SC2001-LK	
Q531	8-729-900-89	TRANSISTOR DTC144ES	
Q532	8-729-900-89	TRANSISTOR DTC144ES	
Q533	8-729-900-65	TRANSISTOR DTA144ES	
Q541	8-729-900-65	TRANSISTOR DTA144ES	
Q542	8-729-900-65	TRANSISTOR DTA144ES	
Q543	8-729-900-61	TRANSISTOR DTA114ES	
Q544	8-729-900-89	TRANSISTOR DTC144ES	
Q545	8-729-900-89	TRANSISTOR DTC144ES	
Q546	8-729-900-80	TRANSISTOR DTC114ES	
Q547	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q548	8-729-142-46	TRANSISTOR 2SC2001-LK	
Q549	8-729-142-46	TRANSISTOR 2SC2001-LK	
Q551	8-729-900-89	TRANSISTOR DTC144ES	
Q552	8-729-900-89	TRANSISTOR DTC144ES	
Q553	8-729-900-65	TRANSISTOR DTA144ES	
Q561	8-729-900-65	TRANSISTOR DTA144ES	
Q562	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q581	8-729-900-65	TRANSISTOR DTA144ES	
Q582	8-729-900-89	TRANSISTOR DTC144ES	
Q601	8-729-900-65	TRANSISTOR DTA144ES	
Q602	8-729-900-89	TRANSISTOR DTC144ES	
Q603	8-729-900-89	TRANSISTOR DTC144ES	
Q604	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q605	8-729-900-89	TRANSISTOR DTC144ES	
Q651	8-729-900-65	TRANSISTOR DTA144ES	
Q652	8-729-900-80	TRANSISTOR DTC114ES	
Q653	8-729-900-89	TRANSISTOR DTC144ES	
Q654	8-729-900-65	TRANSISTOR DTA144ES	
Q701	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q702	8-729-924-90	TRANSISTOR 2SB1370-EF	
Q703	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q704	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q705	8-729-111-55	TRANSISTOR 2SD1312-K	
Q706	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q707	8-729-140-04	TRANSISTOR 2SB1116A-L	
Q751	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q752	8-729-111-55	TRANSISTOR 2SD1312-K	
Q753	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q754	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q755	8-729-924-90	TRANSISTOR 2SB1370-EF	
Q756	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q757	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q801	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q802	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q803	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q831	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q832	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q841	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q842	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q871	8-729-900-65	TRANSISTOR DTA144ES	
Q872	8-729-900-80	TRANSISTOR DTC114ES	
Q873	8-729-900-80	TRANSISTOR DTC114ES	
Q874	8-729-900-80	TRANSISTOR DTC114ES	
Q881	8-729-900-65	TRANSISTOR DTA144ES	
Q882	8-729-900-89	TRANSISTOR DTC144ES	
Q883	8-729-900-80	TRANSISTOR DTC114ES	
Q884	8-729-900-80	TRANSISTOR DTC114ES	
Q885	8-729-900-80	TRANSISTOR DTC114ES	

MAIN

Ref. No.		Part No.	Description				Remark
			< RESISTOR >				
R121		1-249-427-11	CARBON	6.8K	5%	1/4W	
R122		1-249-435-11	CARBON	33K	5%	1/4W	
R123	⚠	1-219-153-11	FUSIBLE	10	5%	1/4W	F
R124		1-247-883-00	CARBON	150K	5%	1/4W	
R131		1-249-428-11	CARBON	8.2K	5%	1/4W	
R132		1-249-433-11	CARBON	22K	5%	1/4W	
R133		1-249-403-11	CARBON	68	5%	1/4W	
R134		1-247-882-11	CARBON	130K	5%	1/4W	
R135		1-249-426-11	CARBON	5.6K	5%	1/4W	
R136		1-249-420-11	CARBON	1.8K	5%	1/4W	
R137		1-247-840-00	CARBON	2.4K	5%	1/4W	
R138		1-247-887-00	CARBON	220K	5%	1/4W	
R139		1-249-425-11	CARBON	4.7K	5%	1/4W	
R141		1-249-427-11	CARBON	6.8K	5%	1/4W	
R142		1-249-435-11	CARBON	33K	5%	1/4W	
R143	⚠	1-219-153-11	FUSIBLE	10	5%	1/4W	F
R144		1-247-883-00	CARBON	150K	5%	1/4W	
R151		1-249-428-11	CARBON	8.2K	5%	1/4W	
R152		1-249-433-11	CARBON	22K	5%	1/4W	
R153		1-249-403-11	CARBON	68	5%	1/4W	
R154		1-247-882-11	CARBON	130K	5%	1/4W	
R155		1-249-426-11	CARBON	5.6K	5%	1/4W	
R156		1-249-420-11	CARBON	1.8K	5%	1/4W	
R157		1-247-840-00	CARBON	2.4K	5%	1/4W	
R158		1-247-887-00	CARBON	220K	5%	1/4W	
R159		1-249-425-11	CARBON	4.7K	5%	1/4W	
R161		1-249-433-11	CARBON	22K	5%	1/4W	
R162		1-249-417-11	CARBON	1K	5%	1/4W	
R163		1-249-421-11	CARBON	2.2K	5%	1/4W	
R164		1-249-432-11	CARBON	18K	5%	1/4W	
R165		1-249-421-11	CARBON	2.2K	5%	1/4W	
R191		1-249-429-11	CARBON	10K	5%	1/4W	
R192		1-247-864-11	CARBON	24K	5%	1/4W	
R193		1-249-434-11	CARBON	27K	5%	1/4W	
R194		1-249-408-11	CARBON	180	5%	1/4W	
R221		1-249-427-11	CARBON	6.8K	5%	1/4W	
R222		1-249-435-11	CARBON	33K	5%	1/4W	
R223	⚠	1-219-153-11	FUSIBLE	10	5%	1/4W	F
R224		1-247-883-00	CARBON	150K	5%	1/4W	
R231		1-249-428-11	CARBON	8.2K	5%	1/4W	
R232		1-249-433-11	CARBON	22K	5%	1/4W	
R233		1-249-403-11	CARBON	68	5%	1/4W	
R234		1-247-882-11	CARBON	130K	5%	1/4W	
R235		1-249-426-11	CARBON	5.6K	5%	1/4W	
R236		1-249-420-11	CARBON	1.8K	5%	1/4W	

Ref. No.		Part No.	Description				Remark
R237		1-247-840-00	CARBON	2.4K	5%	1/4W	
R238		1-247-887-00	CARBON	220K	5%	1/4W	
R239		1-249-425-11	CARBON	4.7K	5%	1/4W	
R241		1-249-427-11	CARBON	6.8K	5%	1/4W	
R242		1-249-435-11	CARBON	33K	5%	1/4W	
R243	⚠	1-219-153-11	FUSIBLE	10	5%	1/4W	F
R244		1-247-883-00	CARBON	150K	5%	1/4W	
R251		1-249-428-11	CARBON	8.2K	5%	1/4W	
R252		1-249-433-11	CARBON	22K	5%	1/4W	
R253		1-249-403-11	CARBON	68	5%	1/4W	
R254		1-247-882-11	CARBON	130K	5%	1/4W	
R255		1-249-426-11	CARBON	5.6K	5%	1/4W	
R256		1-249-420-11	CARBON	1.8K	5%	1/4W	
R257		1-247-840-00	CARBON	2.4K	5%	1/4W	
R258		1-247-887-00	CARBON	220K	5%	1/4W	
R259		1-249-425-11	CARBON	4.7K	5%	1/4W	
R261		1-249-433-11	CARBON	22K	5%	1/4W	
R262		1-249-417-11	CARBON	1K	5%	1/4W	
R263		1-249-421-11	CARBON	2.2K	5%	1/4W	
R264		1-249-432-11	CARBON	18K	5%	1/4W	
R265		1-249-421-11	CARBON	2.2K	5%	1/4W	
R291		1-249-429-11	CARBON	10K	5%	1/4W	
R292		1-247-864-11	CARBON	24K	5%	1/4W	
R293		1-249-434-11	CARBON	27K	5%	1/4W	
R294		1-249-408-11	CARBON	180	5%	1/4W	
R301		1-249-429-11	CARBON	10K	5%	1/4W	
R302		1-249-425-11	CARBON	4.7K	5%	1/4W	
R304		1-249-425-11	CARBON	4.7K	5%	1/4W	
R305		1-249-425-11	CARBON	4.7K	5%	1/4W	
R306		1-249-425-11	CARBON	4.7K	5%	1/4W	
R351		1-249-429-11	CARBON	10K	5%	1/4W	
R352		1-249-425-11	CARBON	4.7K	5%	1/4W	
R354		1-249-425-11	CARBON	4.7K	5%	1/4W	
R355		1-249-425-11	CARBON	4.7K	5%	1/4W	
R356		1-249-425-11	CARBON	4.7K	5%	1/4W	
R401		1-249-429-11	CARBON	10K	5%	1/4W	
R402		1-249-425-11	CARBON	4.7K	5%	1/4W	
R404		1-249-425-11	CARBON	4.7K	5%	1/4W	
R405		1-249-425-11	CARBON	4.7K	5%	1/4W	
R406		1-249-425-11	CARBON	4.7K	5%	1/4W	
R451		1-249-429-11	CARBON	10K	5%	1/4W	
R452		1-249-425-11	CARBON	4.7K	5%	1/4W	
R454		1-249-425-11	CARBON	4.7K	5%	1/4W	
R455		1-249-425-11	CARBON	4.7K	5%	1/4W	
R456		1-249-425-11	CARBON	4.7K	5%	1/4W	
R521		1-249-425-11	CARBON	4.7K	5%	1/4W	
R522		1-249-422-11	CARBON	2.7K	5%	1/4W	
R523		1-249-430-11	CARBON	12K	5%	1/4W	
R524		1-249-441-11	CARBON	100K	5%	1/4W	

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
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Ne les remplacer que par une pièce portant le neméro spécifié.

MAIN

Ref. No.	Part No.	Description				Remark
R526	1-247-844-11	CARBON	3.6K	5%	1/4W	
R527	1-249-421-11	CARBON	2.2K	5%	1/4W	
R528	1-249-429-11	CARBON	10K	5%	1/4W	
R529	1-249-437-11	CARBON	47K	5%	1/4W	
R530	1-249-437-11	CARBON	47K	5%	1/4W	
R531	1-249-389-11	CARBON	4.7	5%	1/4W	
R532	1-249-389-11	CARBON	4.7	5%	1/4W	
R541	1-249-425-11	CARBON	4.7K	5%	1/4W	
R542	1-249-422-11	CARBON	2.7K	5%	1/4W	
R543	1-249-430-11	CARBON	12K	5%	1/4W	
R544	1-249-441-11	CARBON	100K	5%	1/4W	
R546	1-249-421-11	CARBON	2.2K	5%	1/4W	
R547	1-249-421-11	CARBON	2.2K	5%	1/4W	
R548	1-249-429-11	CARBON	10K	5%	1/4W	
R549	1-249-437-11	CARBON	47K	5%	1/4W	
R550	1-249-437-11	CARBON	47K	5%	1/4W	
R551	1-249-389-11	CARBON	4.7	5%	1/4W	
R552	1-249-389-11	CARBON	4.7	5%	1/4W	
R561	1-249-409-11	CARBON	220	5%	1/4W	
R562	1-249-433-11	CARBON	22K	5%	1/4W	
R581	1-247-887-00	CARBON	220K	5%	1/4W	
R582	1-249-425-11	CARBON	4.7K	5%	1/4W	
R583	1-249-437-11	CARBON	47K	5%	1/4W	
R584	1-249-428-11	CARBON	8.2K	5%	1/4W	
R585	1-249-441-11	CARBON	100K	5%	1/4W	
R586	1-249-423-11	CARBON	3.3K	5%	1/4W	
R587	1-249-421-11	CARBON	2.2K	5%	1/4W	
R588	1-249-441-11	CARBON	100K	5%	1/4W	
R601	1-249-417-11	CARBON	1K	5%	1/4W	
R602	1-249-441-11	CARBON	100K	5%	1/4W	
R603	1-247-864-11	CARBON	24K	5%	1/4W	
R604	1-249-433-11	CARBON	22K	5%	1/4W	
R621	1-249-434-11	CARBON	27K	5%	1/4W	
R622	1-249-434-11	CARBON	27K	5%	1/4W	
R623	1-247-874-11	CARBON	62K	5%	1/4W	
R624	1-247-883-00	CARBON	150K	5%	1/4W	
R625	1-249-437-11	CARBON	47K	5%	1/4W	
R626	1-249-439-11	CARBON	68K	5%	1/4W	
R631	1-249-436-11	CARBON	39K	5%	1/4W	
R632	1-247-868-11	CARBON	36K	5%	1/4W	
R633	1-247-880-11	CARBON	110K	5%	1/4W	
R634	1-247-885-00	CARBON	180K	5%	1/4W	
R635	1-249-437-11	CARBON	47K	5%	1/4W	
R636	1-247-889-00	CARBON	270K	5%	1/4W	
R641	1-249-436-11	CARBON	39K	5%	1/4W	
R642	1-249-436-11	CARBON	39K	5%	1/4W	
R643	1-249-439-11	CARBON	68K	5%	1/4W	
R644	1-247-883-00	CARBON	150K	5%	1/4W	
R645	1-247-868-11	CARBON	36K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R646	1-249-441-11	CARBON	100K	5%	1/4W	
R651	1-249-417-11	CARBON	1K	5%	1/4W	
R652	1-249-441-11	CARBON	100K	5%	1/4W	
R653	1-247-864-11	CARBON	24K	5%	1/4W	
R655	1-247-887-00	CARBON	220K	5%	1/4W	
R656	1-249-429-11	CARBON	10K	5%	1/4W	
R662	1-249-434-11	CARBON	27K	5%	1/4W	
R663	1-249-434-11	CARBON	27K	5%	1/4W	
R664	1-249-439-11	CARBON	68K	5%	1/4W	
R665	1-247-885-00	CARBON	180K	5%	1/4W	
R666	1-249-437-11	CARBON	47K	5%	1/4W	
R667	1-249-439-11	CARBON	68K	5%	1/4W	
R668	1-249-436-11	CARBON	39K	5%	1/4W	
R669	1-247-868-11	CARBON	36K	5%	1/4W	
R670	1-247-883-00	CARBON	150K	5%	1/4W	
R671	1-247-887-00	CARBON	220K	5%	1/4W	
R672	1-247-870-11	CARBON	43K	5%	1/4W	
R673	1-247-889-00	CARBON	270K	5%	1/4W	
R674	1-249-436-11	CARBON	39K	5%	1/4W	
R675	1-249-436-11	CARBON	39K	5%	1/4W	
R676	1-249-440-11	CARBON	82K	5%	1/4W	
R677	1-247-885-00	CARBON	180K	5%	1/4W	
R678	1-247-868-11	CARBON	36K	5%	1/4W	
R679	1-249-441-11	CARBON	100K	5%	1/4W	
R681	1-247-858-11	CARBON	13K	5%	1/4W	
R682	1-247-866-11	CARBON	30K	5%	1/4W	
R683	1-247-858-11	CARBON	13K	5%	1/4W	
R684	1-249-438-11	CARBON	56K	5%	1/4W	
R685	1-249-435-11	CARBON	33K	5%	1/4W	
R686	1-247-885-00	CARBON	180K	5%	1/4W	
R687	1-247-864-11	CARBON	24K	5%	1/4W	
R688	1-247-870-11	CARBON	43K	5%	1/4W	
R689	1-249-435-11	CARBON	33K	5%	1/4W	
R690	1-249-438-11	CARBON	56K	5%	1/4W	
R691	1-247-866-11	CARBON	30K	5%	1/4W	
R692	1-247-887-00	CARBON	220K	5%	1/4W	
R693	1-247-862-11	CARBON	20K	5%	1/4W	
R694	1-247-870-11	CARBON	43K	5%	1/4W	
R695	1-249-429-11	CARBON	10K	5%	1/4W	
R696	1-249-437-11	CARBON	47K	5%	1/4W	
R697	1-249-435-11	CARBON	33K	5%	1/4W	
R698	1-247-885-00	CARBON	180K	5%	1/4W	
R700	⚠ 1-219-119-91	FUSIBLE	0.1	5%	1/4W	F
R701	1-249-433-11	CARBON	22K	5%	1/4W	
R702	1-249-421-11	CARBON	2.2K	5%	1/4W	
R703	1-219-154-91	FUSIBLE	0.12	10%	1/4W	
R704	1-219-136-11	FUSIBLE	0.22	10%	1/4W	
R705	1-249-422-11	CARBON	2.7K	5%	1/4W	
R706	1-249-421-11	CARBON	2.2K	5%	1/4W	

Note:
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Ref. No.	Part No.	Description				Remark
R707	1-249-421-11	CARBON	2.2K	5%	1/4W	
R708	1-249-430-11	CARBON	12K	5%	1/4W	
R709	1-247-856-00	CARBON	11K	5%	1/4W	
R710	1-249-436-11	CARBON	39K	5%	1/4W	
R751	1-249-433-11	CARBON	22K	5%	1/4W	
R752	1-249-421-11	CARBON	2.2K	5%	1/4W	
R753	1-249-421-11	CARBON	2.2K	5%	1/4W	
R754	1-249-421-11	CARBON	2.2K	5%	1/4W	
R755	1-249-421-11	CARBON	2.2K	5%	1/4W	
R756	1-249-417-11	CARBON	1K	5%	1/4W	
R757	1-249-417-11	CARBON	1K	5%	1/4W	
R758	1-249-417-11	CARBON	1K	5%	1/4W	
R759	1-249-415-11	CARBON	680	5%	1/4W	
R760	1-249-422-11	CARBON	2.7K	5%	1/4W	
R761	1-249-424-11	CARBON	3.9K	5%	1/4W	
R762	1-249-423-11	CARBON	3.3K	5%	1/4W	
R763	1-249-405-11	CARBON	100	5%	1/4W	
R801	1-249-405-11	CARBON	100	5%	1/4W	
R802	1-249-405-11	CARBON	100	5%	1/4W	
R806	1-249-421-11	CARBON	2.2K	5%	1/4W	
R807	1-249-421-11	CARBON	2.2K	5%	1/4W	
R808	1-249-421-11	CARBON	2.2K	5%	1/4W	
R809	1-249-421-11	CARBON	2.2K	5%	1/4W	
R810	1-249-421-11	CARBON	2.2K	5%	1/4W	
R811	1-249-433-11	CARBON	22K	5%	1/4W	
R812	1-249-433-11	CARBON	22K	5%	1/4W	
R813	1-247-903-00	CARBON	1M	5%	1/4W	
R814	1-249-425-11	CARBON	4.7K	5%	1/4W	
R815	1-249-433-11	CARBON	22K	5%	1/4W	
R816	1-249-433-11	CARBON	22K	5%	1/4W	
R817	1-249-424-11	CARBON	3.9K	5%	1/4W	
R818	1-249-433-11	CARBON	22K	5%	1/4W	
R819	1-249-433-11	CARBON	22K	5%	1/4W	
R820	1-249-429-11	CARBON	10K	5%	1/4W	
R821	1-249-441-11	CARBON	100K	5%	1/4W	
R822	1-249-417-11	CARBON	1K	5%	1/4W	
R823	1-249-437-11	CARBON	47K	5%	1/4W	
R824	1-249-420-11	CARBON	1.8K	5%	1/4W	
R825	1-249-417-11	CARBON	1K	5%	1/4W	
R826	1-249-429-11	CARBON	10K	5%	1/4W	
R827	1-249-429-11	CARBON	10K	5%	1/4W	
R828	1-249-415-11	CARBON	680	5%	1/4W	
R829 ⚠	1-249-482-11	CARBON	4.7	5%	1/2W	F
R831	1-249-429-11	CARBON	10K	5%	1/4W	
R832	1-249-433-11	CARBON	22K	5%	1/4W	
R833	1-249-429-11	CARBON	10K	5%	1/4W	
R834	1-249-421-11	CARBON	2.2K	5%	1/4W	
R835	1-249-429-11	CARBON	10K	5%	1/4W	
R836	1-249-417-11	CARBON	1K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R837	1-249-412-11	CARBON	390	5%	1/4W	
R841	1-249-429-11	CARBON	10K	5%	1/4W	
R842	1-249-433-11	CARBON	22K	5%	1/4W	
R843	1-249-429-11	CARBON	10K	5%	1/4W	
R844	1-249-421-11	CARBON	2.2K	5%	1/4W	
R845	1-249-429-11	CARBON	10K	5%	1/4W	
R846	1-249-417-11	CARBON	1K	5%	1/4W	
R847	1-249-412-11	CARBON	390	5%	1/4W	
R851	1-247-903-00	CARBON	1M	5%	1/4W	
R852	1-249-425-11	CARBON	4.7K	5%	1/4W	
R853	1-249-425-11	CARBON	4.7K	5%	1/4W	
R854	1-249-425-11	CARBON	4.7K	5%	1/4W	
R855	1-249-425-11	CARBON	4.7K	5%	1/4W	
R856	1-249-425-11	CARBON	4.7K	5%	1/4W	
R857	1-249-425-11	CARBON	4.7K	5%	1/4W	
R858	1-249-425-11	CARBON	4.7K	5%	1/4W	
R859	1-249-425-11	CARBON	4.7K	5%	1/4W	
R861	1-249-436-11	CARBON	39K	5%	1/4W	
R862	1-249-436-11	CARBON	39K	5%	1/4W	
R863	1-247-895-00	CARBON	470K	5%	1/4W	
R864	1-247-895-00	CARBON	470K	5%	1/4W	
R865	1-249-436-11	CARBON	39K	5%	1/4W	
R866	1-249-436-11	CARBON	39K	5%	1/4W	
R867	1-247-895-00	CARBON	470K	5%	1/4W	
R868	1-247-895-00	CARBON	470K	5%	1/4W	
R869	1-249-429-11	CARBON	10K	5%	1/4W	
R871	1-249-433-11	CARBON	22K	5%	1/4W	
R872	1-249-434-11	CARBON	27K	5%	1/4W	
R873	1-249-411-11	CARBON	330	5%	1/4W	
R874	1-247-830-11	CARBON	910	5%	1/4W	
R875	1-249-418-11	CARBON	1.2K	5%	1/4W	
R876	1-249-417-11	CARBON	1K	5%	1/4W	
R877 ⚠	1-249-482-11	CARBON	4.7	5%	1/2W	F
R878	1-249-421-11	CARBON	2.2K	5%	1/4W	
R879	1-249-419-11	CARBON	1.5K	5%	1/4W	
R880	1-249-417-11	CARBON	1K	5%	1/4W	
R881 ⚠	1-249-482-11	CARBON	4.7	5%	1/2W	F
R882	1-249-433-11	CARBON	22K	5%	1/4W	
R883	1-249-434-11	CARBON	27K	5%	1/4W	
R884	1-249-411-11	CARBON	330	5%	1/4W	
R885	1-247-830-11	CARBON	910	5%	1/4W	
R886	1-249-418-11	CARBON	1.2K	5%	1/4W	
R887 ⚠	1-249-482-11	CARBON	4.7	5%	1/2W	F
R888	1-249-417-11	CARBON	1K	5%	1/4W	
R889	1-249-419-11	CARBON	1.5K	5%	1/4W	
R890	1-249-421-11	CARBON	2.2K	5%	1/4W	
R891	1-249-417-11	CARBON	1K	5%	1/4W	
R892 ⚠	1-249-482-11	CARBON	4.7	5%	1/2W	F
R893	1-249-433-11	CARBON	22K	5%	1/4W	

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le neméro spécifié.

MAIN REEL PANEL

Ref. No.	Part No.	Description				Remark
R894	1-249-393-11	CARBON	10	5%	1/4W	(WR97ES:US, Canadian)
R895	1-249-429-11	CARBON	10K	5%	1/4W	(WR97ES:US, Canadian)
R896	1-249-429-11	CARBON	10K	5%	1/4W	(WR97ES:US, Canadian)
R897	1-249-405-11	CARBON	100	5%	1/4W	(WR97ES:US, Canadian)
R898	1-249-429-11	CARBON	10K	5%	1/4W	(WR97ES:US, Canadian)
R899	1-249-429-11	CARBON	10K	5%	1/4W	(WR97ES:US, Canadian)
		< VARIABLE RESISTOR >				
RV121	1-238-601-11	RES, ADJ, CARBON 22K				
RV131	1-238-600-11	RES, ADJ, CARBON 10K				
RV141	1-238-601-11	RES, ADJ, CARBON 22K				
RV151	1-238-600-11	RES, ADJ, CARBON 10K				
RV221	1-238-601-11	RES, ADJ, CARBON 22K				
RV231	1-238-600-11	RES, ADJ, CARBON 10K				
RV241	1-238-601-11	RES, ADJ, CARBON 22K				
RV251	1-238-600-11	RES, ADJ, CARBON 10K				
RV301	1-238-600-11	RES, ADJ, CARBON 10K				
RV351	1-238-600-11	RES, ADJ, CARBON 10K				
RV401	1-238-600-11	RES, ADJ, CARBON 10K				
RV451	1-238-600-11	RES, ADJ, CARBON 10K				
RV831	1-238-602-11	RES, ADJ, CARBON 47K				
RV841	1-238-602-11	RES, ADJ, CARBON 47K				
RV871	1-238-600-11	RES, ADJ, CARBON 10K				
RV872	1-238-599-11	RES, ADJ, CARBON 4.7K				
RV881	1-238-600-11	RES, ADJ, CARBON 10K				
RV882	1-238-599-11	RES, ADJ, CARBON 4.7K				
		< RELAY >				
RY531	1-515-683-11	RELAY				
RY551	1-515-683-11	RELAY				
		< SWITCH >				
S599	1-571-083-11	SWITCH, SLIDE (MPX FILTER)				(WR870:Germany/WR97ES)
		< TRANSFORMER >				
T121	1-433-382-11	TRANSFORMER, OSCILLATION				
T141	1-433-382-11	TRANSFORMER, OSCILLATION				
T221	1-433-382-11	TRANSFORMER, OSCILLATION				
T241	1-433-382-11	TRANSFORMER, OSCILLATION				
T521	1-433-336-11	TRANSFORMER, BIAS OSCILLATION				
T541	1-433-336-11	TRANSFORMER, BIAS OSCILLATION				

Ref. No.	Part No.	Description				Remark
		< TEST PIN >				
TP521	* 1-564-506-11	PLUG, CONNECTOR 3P				
TP541	* 1-564-506-11	PLUG, CONNECTOR 3P				
TP581	* 1-564-505-11	PLUG, CONNECTOR 2P				
TP801	* 1-564-505-11	PLUG, CONNECTOR 2P				
TP802	* 1-564-505-11	PLUG, CONNECTOR 2P				
TP803	* 1-564-505-11	PLUG, CONNECTOR 2P				
		< CERAMIC >				
X801	1-577-358-21	VIBRATOR, CERAMIC (4.0MHz)				
X802	1-577-358-21	VIBRATOR, CERAMIC (4.0MHz)				
	* 1-632-741-11	REEL MOTOR BOARD				
		< CAPACITOR >				
C1051	1-124-907-11	ELECT	10uF	20%	50V	
C1052	1-124-907-11	ELECT	10uF	20%	50V	
C1053	1-164-159-11	CERAMIC	0.1uF		50V	
		< CONNECTOR >				
CN1051	1-564-501-11	PIN, CONNECTOR 8P				
CN1052	* 1-564-720-11	PIN, CONNECTOR (SMALL TYPE) 4P				
CN1053	* 1-564-718-11	PIN, CONNECTOR (SMALL TYPE) 2P				
		< RESISTOR >				
R1051	1-249-414-11	CARBON	560	5%	1/4W	
	* A-2006-395-A	PANEL BOARD, COMPLETE (WR870: UK)				
	* A-2006-534-A	PANEL BOARD, COMPLETE				(WR97ES: US, Canadian)
	* A-2006-546-A	PANEL BOARD, COMPLETE				(WR870: Germany/WR97ES: E)
	* A-2006-615-A	PANEL BOARD, COMPLETE				(WR870: AEP)
	* 3-362-478-01	HOLDER (T), LED				
	3-365-420-01	HOLDER, FL TUBE				
	9-911-844-XX	CUSHION				
		< CAPACITOR >				
C71	1-124-126-00	ELECT	47uF	20%	10V	
C72	1-124-126-00	ELECT	47uF	20%	10V	
C73	1-124-126-00	ELECT	47uF	20%	10V	
C74	1-124-126-00	ELECT	47uF	20%	10V	
C75	1-124-903-11	ELECT	1uF	20%	50V	
C171	1-126-157-11	ELECT	10uF	20%	16V	
C172	1-162-288-31	CERAMIC	330PF	10%	50V	
C271	1-126-157-11	ELECT	10uF	20%	16V	
C272	1-162-288-31	CERAMIC	330PF	10%	50V	
C371	1-124-927-11	ELECT	4.7uF	20%	100V	

PANEL

Ref. No.	Part No.	Description			Remark
C372	1-124-927-11	ELECT	4.7uF	20%	100V
C373	1-161-375-00	CERAMIC	0.0022uF	20%	50V
C375	1-124-927-11	ELECT	4.7uF	20%	100V
C376	1-136-171-00	FILM	0.33uF	5%	50V
C377	1-136-174-00	FILM	0.56uF	5%	50V
C378	1-130-475-00	MYLAR	0.0022uF	5%	50V
C379	1-130-475-00	MYLAR	0.0022uF	5%	50V
C380	1-124-768-11	ELECT	4.7uF	20%	50V
C381	1-124-927-11	ELECT	4.7uF	20%	100V
C382	1-136-171-00	FILM	0.33uF	5%	50V
C383	1-136-174-00	FILM	0.56uF	5%	50V
C384	1-130-475-00	MYLAR	0.0022uF	5%	50V
C385	1-130-475-00	MYLAR	0.0022uF	5%	50V
C386	1-124-768-11	ELECT	4.7uF	20%	50V
C471	1-124-927-11	ELECT	4.7uF	20%	100V
C472	1-124-927-11	ELECT	4.7uF	20%	100V
C473	1-161-375-00	CERAMIC	0.0022uF	20%	50V
C475	1-124-927-11	ELECT	4.7uF	20%	100V
C476	1-136-171-00	FILM	0.33uF	5%	50V
C477	1-136-174-00	FILM	0.56uF	5%	50V
C478	1-130-475-00	MYLAR	0.0022uF	5%	50V
C479	1-130-475-00	MYLAR	0.0022uF	5%	50V
C480	1-124-768-11	ELECT	4.7uF	20%	50V
C481	1-124-927-11	ELECT	4.7uF	20%	100V
C482	1-136-171-00	FILM	0.33uF	5%	50V
C483	1-136-174-00	FILM	0.56uF	5%	50V
C484	1-130-475-00	MYLAR	0.0022uF	5%	50V
C485	1-130-475-00	MYLAR	0.0022uF	5%	50V
C486	1-124-768-11	ELECT	4.7uF	20%	50V
C571	1-126-157-11	ELECT	10uF	20%	16V
C572	1-126-157-11	ELECT	10uF	20%	16V
C573	1-161-494-00	CERAMIC	0.022uF		25V
C808	1-164-159-11	CERAMIC	0.1uF		50V
C809	1-164-159-11	CERAMIC	0.1uF		50V
C810	1-124-927-11	ELECT	4.7uF	20%	100V
C899	1-164-159-11	CERAMIC	0.1uF		50V
C901	1-161-494-00	CERAMIC	0.022uF		25V
C902	1-164-159-11	CERAMIC	0.1uF		50V
C903	1-124-443-00	ELECT	100uF	20%	10V
C904	1-162-294-31	CERAMIC	0.001uF	10%	50V
C999	1-164-159-11	CERAMIC	0.1uF		50V (WR97ES:US, Canadian)
		< CONNECTOR >			
CN71	* 1-563-664-11	CONNECTOR 13P			
CN72	* 1-563-664-11	CONNECTOR 13P			
CN73	* 1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P			
CN74	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P			
CN75	* 1-564-336-00	PIN, CONNECTOR 2P (WR870:Germany/WR97ES)			
CN76	* 1-564-722-11	PIN, CONNECTOR (SMALL TYPE) 6P			
CN563	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P			
CN572	* 1-564-721-11	PIN, CONNECTOR (SMALL TYPE) 5P			
		< DIODE >			
D71	8-719-912-20	DIODE 1SS120			
D72	8-719-912-20	DIODE 1SS120			
D73	8-719-933-54	DIODE HZS9A2L			
D74	8-719-912-20	DIODE 1SS120			
D75	8-719-912-20	DIODE 1SS120			
D76	8-719-933-54	DIODE HZS9A2L			
D901	8-719-301-39	DIODE SEL2210S-D			
		< FLUORESCENT INDICATOR >			
FL901	1-519-594-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC71	8-759-634-51	IC M5218AP			
IC72	8-752-035-94	IC CXA1331S			
IC73	8-752-035-94	IC CXA1331S			
IC74	8-759-000-49	IC MC14066BCP			
IC75	8-759-000-49	IC MC14066BCP			
IC76	8-759-000-49	IC MC14066BCP			
IC507	8-759-634-50	IC M5218AL			
IC901	8-759-323-40	IC HD614023SA85			
IC902	8-741-100-48	IC SBX1610-59			
		< JACK >			
J501	1-507-796-71	JACK (PHONES)			
		< FILTER >			
LPF371	1-236-147-11	FILTER, LOW PASS			
LPF471	1-236-147-11	FILTER, LOW PASS			
		< TRANSISTOR >			
Q71	8-729-900-65	TRANSISTOR DTA144ES			
Q72	8-729-900-65	TRANSISTOR DTA144ES			
Q73	8-729-900-65	TRANSISTOR DTA144ES			
Q74	8-729-900-80	TRANSISTOR DTC114ES			
Q75	8-729-900-65	TRANSISTOR DTA144ES			
Q76	8-729-900-65	TRANSISTOR DTA144ES			
Q77	8-729-900-80	TRANSISTOR DTC114ES			
Q78	8-729-900-65	TRANSISTOR DTA144ES			
Q79	8-729-900-89	TRANSISTOR DTC144ES			
Q80	8-729-900-65	TRANSISTOR DTA144ES			
Q81	8-729-900-89	TRANSISTOR DTC144ES			
Q82	8-729-900-65	TRANSISTOR DTA144ES			
Q83	8-729-900-89	TRANSISTOR DTC144ES			

PANEL

Ref. No.	Part No.	Description			Remark
Q371	8-729-900-80	TRANSISTOR DTC114ES			
Q471	8-729-900-80	TRANSISTOR DTC114ES			
Q901	8-729-900-61	TRANSISTOR DTA114ES			
Q902	8-729-900-61	TRANSISTOR DTA114ES			
Q903	8-729-620-05	TRANSISTOR 2SC2603-EF			
		< RESISTOR >			
R71	1-249-425-11	CARBON	4.7K	5% 1/4W	
R72	1-215-455-00	METAL	27K	1% 1/6W	
R73	1-249-417-11	CARBON	1K	5% 1/4W	
R74	1-215-455-00	METAL	27K	1% 1/6W	
R75	1-249-417-11	CARBON	1K	5% 1/4W	
R76	1-249-433-11	CARBON	22K	5% 1/4W	
R77	1-249-429-11	CARBON	10K	5% 1/4W	
R78	1-249-433-11	CARBON	22K	5% 1/4W	
R79	1-249-433-11	CARBON	22K	5% 1/4W	
R80	1-249-429-11	CARBON	10K	5% 1/4W	
R81	1-249-433-11	CARBON	22K	5% 1/4W	
R82	1-249-435-11	CARBON	33K	5% 1/4W	
R83	1-249-435-11	CARBON	33K	5% 1/4W	
R84	1-249-435-11	CARBON	33K	5% 1/4W	
R001	1-249-673-11	CARBON	1K	5% 1/2W	
R002	1-249-673-11	CARBON	1K	5% 1/2W	
R171	1-249-432-11	CARBON	18K	5% 1/4W	
R172	1-249-421-11	CARBON	2.2K	5% 1/4W	
R173	1-249-432-11	CARBON	18K	5% 1/4W	
R174	1-249-409-11	CARBON	220	5% 1/4W	
R271	1-249-432-11	CARBON	18K	5% 1/4W	
R272	1-249-421-11	CARBON	2.2K	5% 1/4W	
R273	1-249-432-11	CARBON	18K	5% 1/4W	
R274	1-249-409-11	CARBON	220	5% 1/4W	
R372	1-249-441-11	CARBON	100K	5% 1/4W	
R373	1-249-435-11	CARBON	33K	5% 1/4W	
R374	1-249-432-11	CARBON	18K	5% 1/4W	
R375	1-249-423-11	CARBON	3.3K	5% 1/4W	
R376	1-249-441-11	CARBON	100K	5% 1/4W	
R377	1-249-429-11	CARBON	10K	5% 1/4W	
R379	1-249-441-11	CARBON	100K	5% 1/4W	
R381	1-249-414-11	CARBON	560	5% 1/4W	
R382	1-247-864-11	CARBON	24K	5% 1/4W	
R383	1-249-441-11	CARBON	100K	5% 1/4W	
R384	1-249-414-11	CARBON	560	5% 1/4W	
R385	1-247-864-11	CARBON	24K	5% 1/4W	
R386	1-249-441-11	CARBON	100K	5% 1/4W	
R391	1-247-878-00	CARBON	91K	5% 1/4W	
R472	1-249-441-11	CARBON	100K	5% 1/4W	
R473	1-249-435-11	CARBON	33K	5% 1/4W	

Ref. No.	Part No.	Description			Remark
R474	1-249-432-11	CARBON	18K	5% 1/4W	
R475	1-249-423-11	CARBON	3.3K	5% 1/4W	
R476	1-249-441-11	CARBON	100K	5% 1/4W	
R477	1-249-429-11	CARBON	10K	5% 1/4W	
R479	1-249-441-11	CARBON	100K	5% 1/4W	
R481	1-249-414-11	CARBON	560	5% 1/4W	
R482	1-247-864-11	CARBON	24K	5% 1/4W	
R483	1-249-441-11	CARBON	100K	5% 1/4W	
R484	1-249-414-11	CARBON	560	5% 1/4W	
R485	1-247-864-11	CARBON	24K	5% 1/4W	
R486	1-249-441-11	CARBON	100K	5% 1/4W	
R491	1-247-878-00	CARBON	91K	5% 1/4W	
R545	1-247-842-11	CARBON	3K	5% 1/4W	
R830	1-249-410-11	CARBON	270	5% 1/4W	
R901	1-249-411-11	CARBON	330	5% 1/4W	
R902	1-249-433-11	CARBON	22K	5% 1/4W	
R903	1-249-433-11	CARBON	22K	5% 1/4W	
R904	1-249-417-11	CARBON	1K	5% 1/4W	
R905	1-247-903-00	CARBON	1M	5% 1/4W	
R906	1-249-441-11	CARBON	100K	5% 1/4W	
R907	1-249-441-11	CARBON	100K	5% 1/4W	
R908	1-249-441-11	CARBON	100K	5% 1/4W	
R951	1-249-407-11	CARBON	150	5% 1/4W	
R952	1-249-409-11	CARBON	220	5% 1/4W	
R953	1-249-411-11	CARBON	330	5% 1/4W	
R954	1-249-421-11	CARBON	2.2K	5% 1/4W	
R955	1-249-420-11	CARBON	1.8K	5% 1/4W	
R961	1-249-407-11	CARBON	150	5% 1/4W	
R962	1-249-422-11	CARBON	2.7K	5% 1/4W	
R963	1-249-420-11	CARBON	1.8K	5% 1/4W	
R971	1-249-407-11	CARBON	150	5% 1/4W	
R972	1-249-409-11	CARBON	220	5% 1/4W	
R973	1-249-411-11	CARBON	330	5% 1/4W	
R974	1-249-413-11	CARBON	470	5% 1/4W	
R975	1-249-415-11	CARBON	680	5% 1/4W	
R976	1-249-417-11	CARBON	1K	5% 1/4W	
R977	1-249-420-11	CARBON	1.8K	5% 1/4W	
R978	1-249-424-11	CARBON	3.9K	5% 1/4W	
R981	1-249-407-11	CARBON	150	5% 1/4W	
R982	1-249-409-11	CARBON	220	5% 1/4W	
R983	1-249-411-11	CARBON	330	5% 1/4W	
R984	1-249-413-11	CARBON	470	5% 1/4W	
R985	1-249-415-11	CARBON	680	5% 1/4W	
R986	1-249-417-11	CARBON	1K	5% 1/4W	
R987	1-249-420-11	CARBON	1.8K	5% 1/4W	
R988	1-249-424-11	CARBON	3.9K	5% 1/4W	
R991	1-249-407-11	CARBON	150	5% 1/4W	
R992	1-249-409-11	CARBON	220	5% 1/4W	
R993	1-249-411-11	CARBON	330	5% 1/4W	

PANEL

Ref. No.	Part No.	Description			Remark
R994	1-249-413-11	CARBON	470	5%	1/4W
R995	1-249-415-11	CARBON	680	5%	1/4W
R996	1-249-417-11	CARBON	1K	5%	1/4W
R997	1-249-420-11	CARBON	1.8K	5%	1/4W
R998	1-249-424-11	CARBON	3.9K	5%	1/4W
		< VARIABLE RESISTOR >			
RV71	1-241-496-11	RES, VAR, CARBON 20K/20K			
RV541	1-238-952-11	RES, VAR, CARBON 5K (BIAS DECK-B)			
RV561	1-238-908-11	RES, VAR, CARBON 20K/50K/50K (REC LEVEL)			
RV562	1-238-953-11	RES, VAR, CARBON 50K/50K (BALANCE)			
RV571	1-238-085-11	REA, VAR, CARBON 20K/20K (PHONES LEVEL)			
		< SWITCH >			
S901	1-554-118-00	SWITCH, PUSH (1 KEY) (POWER)			
S951	1-554-303-21	SWITCH, TACTILE (BLANK SKIP)			
S952	1-554-303-21	SWITCH, TACTILE (AUTO PAUSE)			
S953	1-554-303-21	SWITCH, TACTILE (AUTO REC LEVEL)			
S954	1-554-303-21	SWITCH, TACTILE (FADER)			
S955	1-571-520-11	SWITCH, SLIDE (DOLBY NR DECK-B)			
S961	1-571-520-11	SWITCH, SLIDE (TIMER)			
S962	1-571-520-11	SWITCH, SLIDE (DOLBY NR DECK-A)			
S971	1-554-303-21	SWITCH, TACTILE (A+B REC)			
S972	1-554-303-21	SWITCH, TACTILE (HIGH SPEED DUBBING)			
S973	1-554-303-21	SWITCH, TACTILE (NORM SPEED DUBBING)			
S974	1-554-303-21	SWITCH, TACTILE (COUNTER RESET DECK-A)			
S975	1-554-303-21	SWITCH, TACTILE (COUNTER MEMORY DECK-A)			
S976	1-554-303-21	SWITCH, TACTILE (COUNTER RESET DECK-B)			
S977	1-554-303-21	SWITCH, TACTILE (COUNTER MEMORY DECK-B)			
S978	1-571-520-11	SWITCH, SLIDE (DIR MODE)			
S981	1-554-303-21	SWITCH, TACTILE (DECK-A:OPEN/CLOSE)			
S982	1-554-303-21	SWITCH, TACTILE (DECK-A:STOP)			
S983	1-554-303-21	SWITCH, TACTILE (DECK-A:FWD)			
S984	1-554-303-21	SWITCH, TACTILE (DECK-A:REV)			
S985	1-554-303-21	SWITCH, TACTILE (DECK-A:PAUSE)			
S986	1-554-303-21	SWITCH, TACTILE (DECK-A:REC MUTE)			
S987	1-554-303-21	SWITCH, TACTILE (DECK-B:REW)			
S988	1-554-303-21	SWITCH, TACTILE (DECK-B:FF)			
S989	1-554-303-21	SWITCH, TACTILE (DECK-B:REC)			
S991	1-554-303-21	SWITCH, TACTILE (DECK-B:OPEN/CLOSE)			
S992	1-554-303-21	SWITCH, TACTILE (DECK-B:STOP)			
S993	1-554-303-21	SWITCH, TACTILE (DECK-B:FWD)			
S994	1-554-303-21	SWITCH, TACTILE (DECK-B:REV)			
S995	1-554-303-21	SWITCH, TACTILE (DECK-B:PAUSE)			
S996	1-554-303-21	SWITCH, TACTILE (DECK-B:REC MUTE)			
S997	1-554-303-21	SWITCH, TACTILE (DECK-A:REW)			
S998	1-554-303-21	SWITCH, TACTILE (DECK-A:FF)			
S999	1-554-303-21	SWITCH, TACTILE (DECK-A:REC)			

Ref. No.	Part No.	Description	Remark
		< CERAMIC >	
X901	1-577-359-21	VIBRATOR, CERAMIC (4.19MHz)	
		**********	
		MISCELLANEOUS	
		**********	
58	⚠ 1-555-465-00	CORD, POWER (WR97ES:US, Canadian)	
59	⚠ 1-569-007-11	ADAPTOR, CONVERSION 2P (WR97ES:E)	
CNJ1	1-558-350-21	CORD (WITH CONNECTOR)	
D1051	8-719-980-85	DIODE SLF-325C	
D1091	8-719-950-74	DIODE SLR-314D-B	
M1051	X-3356-638-1	MOTOR (REEL R) ASSY	
M1052	X-3356-604-1	MOTOR (ASSIST) ASSY	
M1053	X-3356-605-1	MOTOR (CAPSTAN R) ASSY	
Q1091	8-729-809-43	SPS-314B-BE	
S1001	1-466-525-11	ENCODER, ROTARY	
T1	⚠ 1-450-444-11	TRANSFORMER, POWER (WR97ES:US, Canadian)	
T1	⚠ 1-450-445-11	TRANSFORMER, POWER (WR97ES:E)	
T1	⚠ 1-450-446-11	TRANSFORMER, POWER (WR870)	
VS1	⚠ 1-570-307-11	SWITCH, VOLTAGE CHANGE	
		**********	
		ACCESSORY & PACKING MATERIAL	
		**********	
	1-465-369-11	COMMANDER, REMOTE (RM-J902) (WR870/WR97ES:E)	
	1-559-533-11	CORD, CONNECTION	
	2-181-754-01	COVER, BATTERY (FOR RM-J902) (WR870/WR97ES:E)	
*	3-354-915-01	CUSHION	
*	3-354-919-21	INDIVIDUAL CARTON	
	3-677-503-00	SHEET (LARGE), PROTECTION (WR97ES:US, Canadian)	
	3-703-450-01	INSTRUCTION	
	3-704-366-01	SCREW (CASE) (M3X8)	
	3-753-074-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (WR870:AEP, UK)	
	3-753-074-21	MANUAL, INSTRUCTION (ENGLISH) (WR97ES:US)	
	3-753-074-31	MANUAL, INSTRUCTION (ENGLISH, FRENCH) (WR97ES:Canadian)	
	3-753-074-41	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN) (WR870:AEP/Germany)	
	3-753-074-51	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (WR97ES:E)	

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le neméro spécifié.

HARDWARE LIST

Ref. No.	Part No.	Description	Remark
# 1	7-682-547-04	SCREW +BVTT 3X6 (S)	
# 2	7-682-548-04	SCREW +BVTT 3X8 (S)	
# 3	7-685-645-79	SCREW +BVTP 3X6 TYPE 2 IT-3	
# 4	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
# 5	7-621-849-00	SCREW (BV/RING)	
# 6	7-621-770-67	SCREW +BVTT 2.6X6 (S)	
# 7	7-685-131-19	SCREW +BTP 2.6X4 TYPE2 N-S	
# 8	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-S	
# 9	7-621-255-20	SCREW +BVTT 2X4 (S)	
#10	7-621-255-35	SCREW +BVTT 2X5 (S)	
#11	7-621-283-00	SCREW +BVTT 2X5 (S)	
#12	7-685-534-19	SCREW +BTP 2.6X8 (E)	
#13	7-685-870-01	SCREW +BVTT 3X5 (S)	
#14	7-621-775-10	SCREW +B 2.6X4	

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